

RioTinto

**Kennecott Eagle Land, LLC**

Jonathan C. Cherry, P.E.  
General Manager  
504 Spruce Street  
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March 25, 2009

Mr. Clifton Clark  
Remediation and Redevelopment Division Supervisor  
Michigan Department of Environmental Quality  
420 5<sup>th</sup> Street  
Gwinn, MI 49841

Dear Mr. Clark:

Subject: **Humboldt Mill – Category N Baseline Environmental Assessment (BEA)**

Enclosed is the Category N Baseline Environmental Assessment (BEA) prepared for the Humboldt Mill site. The Humboldt Mill site is composed of three parcels acquired by Kennecott Eagle Land, LLC (KEL) in September 2008. The BEA discloses data and documentation regarding existing environmental conditions present at the site in accordance with R 299.5919. KEL is disclosing the BEA to the Michigan Department of Environmental Quality (MDEQ) to effectuate and maintain liability protection pursuant to Section 20126 (1) (c) of the Natural Resources and Environmental Protection Act (P.A. 451, as amended). KEL is not seeking a determination from the MDEQ regarding the adequacy of this BEA.

If you need additional information or have questions, please contact myself or Vicky Peacey at (906) 486-1257.

Sincerely,



Jonathan C. Cherry, P.E.  
General Manager

cc: Gene Smary – Warner Norcross & Judd LLP  
Allen Reilly – Horizon Environmental  
Steve Donohue – Foth Infrastructure & Environment, LLC, w/o attachment  
Vicky Peacey – Kennecott Eagle Minerals Company

File: EC-Humboldt-BEA-Corres to MDEQ



March 25, 2009

Mr. Jonathan Chéry  
Kennecott Eagle Land, LLC  
504 Spruce Street  
Ishpeming, MI 49849

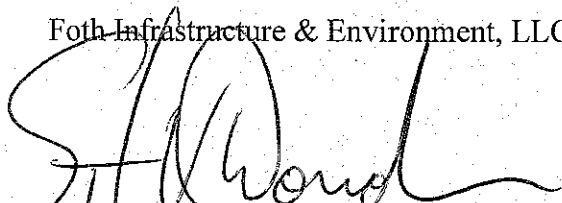
Dear Mr. Cherry:

RE: Humboldt Mill- Baseline Environmental Assessment


Enclosed for your distribution is the Humboldt Mill - Baseline Environmental Assessment (BEA). The BEA has been prepared as a Category N BEA for three parcels that comprise the Humboldt Mill site. A Category N BEA can be prepared when no significant hazardous substance use will occur at the site. As explained in the BEA, while certain rehabilitation, demolition and excavation activities will take place, new chemicals will not be introduced as KEL takes ownership of the site.

Sincerely,

Foth Infrastructure & Environment, LLC



Stephen V. Donohue, P.H.  
Director



Curtis E. Dungey, CHMM  
Environmental Compliance Specialist

**Humboldt Mill**  
**Baseline Environmental Assessment**

**Distribution**

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<u>No. of Copies</u>	<u>Sent To</u>
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4	Mr. Jonathan Cherry Kennecott Eagle Land, LLC 504 Spruce Street Ishpeming, MI 49849

**Humboldt Mill**

**Baseline Environmental Assessment**

Project ID: 06W003

Prepared for  
**Kennecott Eagle Land, LLC**

Prepared by  
**Foth Infrastructure & Environment, LLC**

December 2008

# Humboldt Mill

## Baseline Environmental Assessment

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# **Humboldt Mill**

## **Baseline Environmental Assessment**

### **Executive Summary**

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Foth Infrastructure & Environment, LLC (Foth) has prepared this Baseline Environmental Assessment (BEA) for Kennecott Eagle Land, LLC (KEL) to document general environmental site conditions and circumstances at the Humboldt Mill site in Humboldt Township, Marquette County, Michigan. The purpose of this BEA is to document prior releases of hazardous substances and existing conditions relative to Part 201 Standards prior to KEL acquiring the property from new releases that might occur after KEL assumes control of the property. This BEA relies upon information and data presented in the Phase I Environmental Site Assessment (ESA) and the Phase II ESA to establish the site is a facility under Part 201 regulations. These two reports identified existing Recognized Environmental Conditions (RECs) at the Humboldt Mill site and presented historical and current data to characterize environmental conditions across the property. The intent is to present adequate data and documentation to the Michigan Department of Environmental Quality (MDEQ) and disclose this information pursuant to R 299.5919 to effectuate and maintain liability protection afforded by Michigan law. KEL will not seek a determination from MDEQ regarding the adequacy of this BEA.

This BEA has been developed in accordance with Section 20126 (1) (c) of 1994 PA 451, Part 201, of the Natural Resources and Environmental Protection Act (NREPA) as amended, and the rules promulgated as part of this law. Preparation of this document followed the BEA Format as set forth on page 14 of the MDEQ guidance document entitled *Preparing and Disclosing Baseline Environmental Assessments and Section 7a, Compliance Analyses* (March 1999). This outline requires certain key issues to be discussed in the BEA to meet the Minimum Technical Standards as described in the regulations.

KEL will not bring hazardous substances onto the site. As such, KEL will rely upon “no significant hazardous substance use” as the means for distinguishing existing contamination from any future releases at the site. Although hazardous substances will be generated during KEL’s intended site rehabilitation/cleanup activities (e.g., lead paint, asbestos, residuals in abandoned containers), these materials are considered part of the pre-existing conditions at the site. Furthermore, KEL intends to manage these “generated” materials in accordance with its Section 7a Due Care Plan so as to not exacerbate existing conditions at the site.

The BEA concludes that information contained herein will be adequate to distinguish new activities from historical operations. Based on this information, KEL is disclosing this information to satisfy MDEQ regulations at R 299.5919 and Section 20126 of the NREPA.

KEL has also completed MDEQ notices and forms as required by the Part 201 regulations to complete this disclosure to MDEQ. They are included with this BEA.

**Humboldt Mill**  
**Baseline Environmental Assessment**  
**List of Abbreviations, Acronyms, and Symbols**

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AST	Aboveground Storage Tank
ASTM	American Society for Testing and Materials
BEA	Baseline Environmental Assessment
DCC	R 299.5746 Residential Soil Direct Contact Criteria
DWPC	R 299.5746 Residential Soil Drinking Water Protection Criteria
DWC	R 299.5744 Residential Groundwater Drinking Water Criteria
ESA	Environmental Site Assessment
Foth	Foth Infrastructure & Environment, LLC
KEL	Kennecott Eagle Land, LLC
MDEQ	Michigan Department of Environmental Quality
MPC	Mineral Processing Corporation
Nos.	numbers
NREPA	Natural Resources Environmental Protection Act
PCB	Polychlorinated Biphenyls
REC	Recognized Environmental Condition
SCA	Sundberg, Carlson & Associates, Inc.
TCLP	Toxic Chemical Leaching Procedure
UST	Underground Storage Tank



# **Humboldt Mill**

## **Baseline Environmental Assessment**

### **Definitions**

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**Baseline Environmental Assessment (BEA)** – This is a defined term under Part 201, Environmental Remediation, of the Natural Resources and Environmental Protection Act (NREPA) 1994 PA 451, as amended. Section 1 (1) (d) defines a BEA as “an evaluation of environmental conditions which exist at a facility at the time of purchase, occupancy, or foreclosure that reasonably defines the existing conditions and circumstances at the facility, so that, in the event of a subsequent release, there is a means of distinguishing the new releases from existing contamination.

**Completed or Date of Completion** – The date when the BEA report is finalized by the submitter for initial disclosure to the MDEQ. The date of completion may not be more than 15 days after the 45-day period to conduct a BEA, or 60 days of becoming an owner or operator.

**Conducted** – When used in reference to the date that a BEA is conducted, means the date when all site history research, field work, laboratory analysis, data interpretation are complete, and preparation of the BEA report is substantially complete. In accordance with section 26(1)(c) of the NREPA, a BEA must be conducted within 45 days of becoming an owner or operator.

**Container** – Means a barrel, drum, tank, vessel, surface impoundment, pipeline or other receptacle, regardless of size that contains a hazardous substance.

**Date of Occupancy** – The time when a person first becomes the operator of the property. No presence on the property is required for a person to have occupancy of the property for the purpose of the BEA process. “Occupancy” is to “operator” as “purchase” is to “owner”.

**Facility** – Means any area, place or property where a hazardous substance in excess of the concentrations which satisfy the cleanup criteria for unrestricted residential use has been released, deposited, disposed of or otherwise comes to be located. Facility does not include any area, place or property at which response activities have been completed which satisfy the cleanup criteria for the residential category or at which corrective action has been completed.

**Hazardous Substance** – This means any of the following:

- ♦ Any substance that the department demonstrates, on a case by case basis, poses an unacceptable risk to public health, safety, welfare or the environment, considering the fate of the material, dose-response, toxicity or adverse impact on natural resources;
- ♦ Hazardous substance as defined in the federal Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) of 1980;
- ♦ Hazardous waste as defined in Part 111, Hazardous Waste Management;

- ♦ Petroleum as described in Part 113, Leaking Underground Storage Tanks.

**Operator** – This is a person who is in control or responsible for operation of a facility. Excluded is a person who holds a security interest or who is acting as a fiduciary.

**Owner** – This is a person who owns a facility. Excluded is a person who holds a security interest or who is acting as a fiduciary.

**Person** – This is an individual, partnership, corporation, association, governmental entity or other legal entity.

**Purchase** – This is a property purchase or the acquisition of ownership interest by any other means including gift, property transfer, inheritance, devise or transfer from an inter vivos or testamentary trust of property that is the subject of the BEA.

**Significant Hazardous Substance Use** – This means the use, storage, handling or management at any time of hazardous substances in quantities that exceed those commonly used for typical residential or office purposes. However, significant hazardous substance use does not include any of the following:

- ♦ gasoline, oil or other vehicle fluids that are contained in vehicles traversing or parked at a property on a short-term basis;
- ♦ storage of hazardous substances for retail sale in packaging and in quantities consistent with use by occupants of residential dwellings;
- ♦ storage or management of aboveground storage tanks, barrels, containers or other receptacles containing hazardous substances that are appropriately identified in the BEA as being abandoned or discarded at the time of purchase, occupancy or foreclosure.
- ♦ Demolition wastes, when demolition is part of a redevelopment project, and the following conditions are met: 1) asbestos, lead, and PCBs containing materials (ballasts, switches, etc.) are abated in accordance with all applicable and appropriate regulations, 2) all contaminated demolition debris is immediately removed from the property for proper disposal in accordance with all applicable and appropriate regulations, and 3) no contaminated debris is stored or left on-site. (BEA Update Bulletin, March 2006).

**Submitter** – This is a person who is seeking liability protection by conducting and disclosing a BEA either through a petition under Section 29a or through a disclosure under Section 26 (1)(c)(ii) of Part 201.

## **Identification of Author and Date BEA was Conducted and Date BEA was Completed**

This BEA was performed in accordance with Section 20126 (1) (c) of 1994 PA 451, Part 201, of the NREPA as amended, and the Rules promulgated as part of this law. This BEA was conducted by Foth Infrastructure and Environment, LLC (Foth) of Green Bay, Wisconsin. Individuals with primary responsibility for data assembly, interpretation and technical conclusions in conjunction with the BEA were as follows:

### **Baseline Environmental Assessment**

- ♦ Curtis E. Dungey, CHMM
- ♦ Jeffrey Lynott, P.G.
- ♦ Stephen V. Donohue, P.H.

The BEA was conducted on September 27, 2008 and was completed on November 14, 2008.

# **1 Introduction**

Foth has prepared this BEA for Kennecott Eagle Land, LLC (KEL) documenting general environmental site conditions at the former Mineral Processing Corporation (MPC) property (Humboldt Mill site) in Humboldt Township, Marquette County, Michigan. The general location of the Humboldt Mill site is depicted on Figure 1-1. The general relationship of the Humboldt Mill site and surrounding property ownership is depicted on Figure 1-2. The purpose of this BEA is to gather sufficient information regarding the Humboldt Mill site to distinguish existing contamination from new releases that might occur after KEL assumes control of the property. This BEA relies upon information and data presented in the Phase I ESA and the Phase II Environmental Site Assessment (ESA) for the Humboldt Mill site. These two reports were completed in 2008 and identified existing Recognized Environmental Conditions (RECs) at the Humboldt Mill site and presented historical and current data to characterize environmental conditions across the property.

## **1.1 Scope of Work**

This BEA has been developed in accordance with Section 20126 (1) (c) of 1994 PA 451, Part 201, of the NREPA as amended, and the rules promulgated as part of this law. This BEA will explain general circumstances of the Humboldt Mill site with regard to past and intended activities, and in particular, identify Technical Standards in R 299.5907 that will be relied upon in reviewing conditions across different portions of the Humboldt Mill site.

This document will generally follow the BEA Format as set forth on page 14 of the MDEQ guidance document for *Preparing and Disclosing Baseline Environmental Assessments and Section 7a Compliance Analyses* (March 1999). This outline requires certain key issues to be discussed in the report to meet the Minimum Technical Standards as described in the regulations. Minimum Technical Standards will vary depending on the level of investigation required. There are three levels of investigation a new owner/operator may follow during preparation of a BEA. If a new owner/operator desires to obtain the exemption available under the Part 201 rules, the appropriate level of investigation must be followed. The most straightforward type of investigation is one where no significant hazardous substances will be used by the new owner/operator. This is referred to as a Category N investigation.

KEL has prepared this Category N BEA for disclosure to effectuate and maintain liability protection in accordance with Section 20126 (1) (c) (ii) of the National Resources and Environmental Protection Act (NREPA) and R 299.5919 of the Part 9 rules. In accordance with Category N BEA requirements, Disclosure Form EQP 4446 is included as Appendix A.

## **1.2 Site History**

The Humboldt Mill site was originally constructed in 1954 and was used to process iron ore that was extracted from three underground mines in an area to the northwest of the mill operations. At this point, the property was owned by Cleveland Cliffs, Inc. This operation continued until about 1979. In addition, areas immediately to the east of the Humboldt Mill site were used for operation of a taconite pellet plant and aboveground storage of fuel oil (see Figure 1-3). Once iron ore mining was suspended, the mill facility was purchased by Callahan Mining Corporation and converted into operations to process gold ore beginning in about 1985. At that point, gold ore was brought to the site from the Ropes mine four miles northwest of Ishpeming, Michigan.

This operation continued until about 1990. Portions of the Humboldt Mill site to the south of the mill operations were used for storage of iron concentrate, pyrite and leach residue. In addition, an area off-site to the south of the mill buildings was used for drainage for a septic system.

In approximately 1995, the Humboldt Mill site was purchased by Minerals Processing Corporation (MPC) to process industrial minerals through dry grinding operations. Only a small portion of the mill buildings were used for this purpose. However, over the past few years, MPC utilized the mill buildings for storage only.

In the early 1990's, certain reclamation activities occurred at the mill site, including activities to remove and dispose of wastes from stockpile areas and reseeded of disturbed areas. These areas were identified as sources of metals to soil and groundwater. Certain hydrogeological studies were also completed at the time on the Humboldt Mill site. In addition, two underground storage tanks were removed and one fuel tank was decommissioned in place. These USTs were previously identified as sources of organic pollutants to groundwater and soil.

From 1995 to 2000, Callahan Mining Corporation continued environmental investigations at the site and discussions with MDEQ for the purpose of obtaining closure at the site under the Part 201 rules. At the time MPC purchased the Humboldt Mill site, it commissioned preparation of a BEA by Sundberg, Carlson & Associates, Inc. (SCA, 1996) to seek liability protection from existing conditions at the site. Although this BEA was prepared over 10 years ago, substantial information is presented in the document that can be used as part of this BEA. The Humboldt Mill site has been reviewed as part of a Phase I ESA (Foth, 2008a) that was performed to identify RECs. This Phase I ESA was initiated in 2006 and updated in 2008. More information on site history and development of the Humboldt Mill site is described in this document. In addition, identified RECs and historical findings were further assessed as part of a Phase II ESA (Foth, 2008b).

### **1.3 KEL's Future Use of the Site**

KEL owns the site and will manage removal of certain equipment and pre-existing residual materials, demolition of structures and replacement of siding and roofing on the mill building. None of these activities will entail significant hazardous substance use. Furthermore, all pre-existing conditions and rehabilitation/clean-up activities will be managed in accordance with KEL's Section 7a Due Care Plan. Consistent with the protocol outlined in the Due Care Plan, fueling of all machinery and mobile equipment that may be used for rehabilitation activities will be done off-site. As such, this Category N BEA is appropriate and documents the past releases of hazardous substances on the property. The Minimum Technical Standards for a Category N BEA as outlined in R 299.5907 are as follows:

- ♦ The report must provide a legal description of the site and provide a scaled map or survey depicting the property;
- ♦ The report must include property tax identification numbers for parcels which are included in whole or in part of the property covered by the BEA;

- ♦ The names and chemical abstract service numbers, when a chemical abstract service number is available, of all hazardous substances known to have been released at the property;
- ♦ The basis for the conclusion the property is a facility;
- ♦ Identification, by general or specific location, of known contamination on the property, including the environmental media affected;
- ♦ The document must include the information on USTs, abandoned storage tanks and discarded containers that are known to be present at the property. Description of known or likely contents and volume should be provided;
- ♦ Photographs that depict important features and evidence of releases that may have occurred, including abandoned and discarded containers;
- ♦ If previous BEA disclosure or petition numbers were submitted for the same parcels, this information must be indicated in the report; and
- ♦ A specific statement that there will be no significant hazardous substance use at the property and that this stipulated condition is the basis for being able to distinguish existing contamination from a new release.

#### **1.4 Regulatory Requirements**

This BEA has been prepared pursuant to regulations developed under Part 201 of the NREPA, PA 451 of 1994. These regulations generally include Part 9 regulations for Baseline Environmental Assessments starting at R 299.5901. This BEA also includes the Part 7 Cleanup Criteria Requirements starting at R 299.5701. These regulations include the generic groundwater cleanup criteria in Table 1 and the generic soil cleanup criteria in Table 2.

## **2 Property Description and Intended Hazardous Substance Use**

### **2.1 Legal Description**

The Humboldt Mill site is located in the southwest and southeast quarters of Section 11, Township 47 East, Range 29 West, Humboldt Township, Marquette County, Michigan. The property is located on County Road 601 east of Highway 95 and south of Highway 41. The address is 4547 County Road 601, Champion, Michigan 49814. The Humboldt Mill site is comprised of two main parcels, the first of which includes a building used to house an office, laboratory and maintenance shop (office/mill dry), the main mill building, former crusher building, an old crusher building currently used to store rock (diamond drill) core, remnants of the secondary crusher, electrical substation, and office trailer. A second parcel includes primarily areas where former pyrite stockpiles were situated. There is also a third parcel, which is an easement to the property from County Road 601. The two main parcels are shown on Figure 1-2 as red boundary lines. The following is the legal description for the Humboldt Mill site:

#### Parcel I

*Beginning at the West Quarter Corner of said Section 11; thence N 0°5'13" E (along the west section line) 1317.71 feet to a 1/16 corner; thence N 36°54'02" E 1654.56 feet, (to the section line between said Section 2 and 11); thence N 89°41'13" E 320.00 feet, to a 1/16 corner; thence N 0°35'15" W 230.00 feet, (along 1/16 line); thence N 55°01'35" E 334.35 feet; thence N 79°47'54" E 1047.15 feet; thence due East 750.00 feet; thence due South 899.93 feet; thence due West 740.54 feet; thence S 34°28'27" W 1886.91 feet; thence due South 220.00 feet; thence S 44°35'07" E 1172.41 feet; thence S 78°00'37" E 495.81 feet; thence S 49°23'09" W 249.39 feet; thence S 11°58'32" W 283.08 feet; thence N 78°01'27" W 169.01 feet; thence S 11°58'32" W 15.00 feet; thence N 78°01'27" W 81.52 feet; thence N 11°58'32" E 15.00 feet; thence N 78°01'27" W 1012.31 feet; thence N 53°58'56" W 747.64 feet; thence N 42°25'15" W 139.23 feet; to the E-W quarter (1/4) line; thence S 89°52'58" W 685.07 feet, to the Point of Beginning. It being understood that only that which is South of the line mentioned above is being conveyed, in accordance with the sketch attached hereto and marked Exhibit A Map, Parcel I.*

#### Parcel II

*Commencing at the S 1/4 Corner of said Section (11); thence Due East 364.85 feet; thence Due North 1528.85 feet, to the Point of Beginning; thence N 77°31'22" W 1037.84 feet; thence N 11°53'37" E 181.04 feet; thence S 78°06'22" E 1037.77; thence S 11°53'37" W 191.61 feet, to the Point of Beginning. Said parcel contains 4.44 acres more or less, and is shown on Exhibit A Map, Parcel II.*

#### Parcel III

*That certain easement dated October 29, 1986, between Humboldt Mining Company and Callahan Mining Corporation, recorded with the Register of Deeds, County of Marquette, Michigan, at Liber 119, Page 987.*

## **2.2 Title Conveyance and Property Tax Identification Number**

KEL acquired title to the Humboldt Mill Site on September 26, 2008. The property tax identification number for parcels that are included in the above legal description is as follows:

52-06-211-001-20

The current property ownership map in Figure 1-2 shows the general site arrangement.

## **2.3 Important Features of the Subject Site and Supporting Photographs**

Important features of the Humboldt Mill site were described extensively in the Phase I ESA and characterized further in the Phase II ESA. In the Phase I ESA, RECs were described in Section 7 as a result of records review, site reconnaissance and interviews with knowledgeable individuals. The Phase II ESA report provides further historical and recent site data with respect to soils, groundwater, and site structures to support these findings. In accordance with R 299.5907 (4), site photographs were obtained during both the Phase I and Phase II ESAs to support the identification of RECs at the Humboldt Mill site. While a set of photographs were presented in the Phase I ESA, these same photographs are reproduced in this report as Appendix B. Each photograph includes the following information:

- ♦ Date the photograph was taken;
- ♦ A description of what the photograph illustrates;
- ♦ The location where the photograph was taken; and
- ♦ Name of the photographer.

## **2.4 Previous BEA Investigations**

MPC completed a BEA at the time it acquired the mill property in 1996 (SCA, 1996). This investigation was completed by SCA Environmental on behalf of MPC. It covered the parcels described above in Section 2.1 for MPC. According to the database research conducted as part of the Phase I ESA in Appendix C, the document was referred to as BEA Number 9 and was submitted to MDEQ on January 16, 1996. A petition determination was not requested.

## **2.5 Hazardous Substance Use**

KEL has acquired title to the Humboldt Mill site, and will focus on site rehabilitation and removal of residual materials. All materials managed during this process will be part of pre-existing conditions. All temporary storage, management and disposal of residual materials will be conducted in accordance with a Section 7A Due Care Plan that has been prepared for the facility. Site rehabilitation activities will improve overall conditions at the site and will reduce the potential for exacerbation of a hazardous substance release due to pre-existing conditions. In addition, KEL will not bring hazardous substances onto the site as part of the site preparation process. Furthermore, all fueling of machinery and mobile equipment that may be done as part of site rehabilitation will be performed off-site.



### **3 Known Contamination**

#### **3.1 Names and CAS Numbers of Hazardous Substances Released**

Historical and recent environmental investigations have documented the presence of hazardous substances above MDEQ residential cleanup standards at the Humboldt Mill site. Hazardous substances identified through these studies are shown in Table 3-1.

#### **3.2 Identification of ASTs, USTs, Other Containers, and Residual Materials on Humboldt Mill Site**

During site reconnaissance, observations regarding existing aboveground storage tanks (ASTs), underground storage tanks (USTs), other containers, and residual materials were made on the Humboldt Mill site. As noted in the Phase I ESA report, there is evidence a Fuel Oil AST was located just northeast of the former pellet plant. It is located off the Humboldt Mill site and is further described below in Section 3.2.4.

##### **3.2.1 Aboveground Storage Tanks**

A review of past environmental reports and physical site inspections conducted as part of the Phase I and Phase II investigations revealed the presence of two small steel aboveground storage tanks located behind the mill building on the Humboldt Mill site. These tanks are identified on Figure 1-3 as "Small Oil ASTs" and are also shown on Photograph 8 in Appendix B. Both of the tanks appear to have been used for storage of fuel oil. Although it was assumed both tanks have previously been drained of product, it was not specifically determined whether either of the tanks currently contains petroleum. Spills and/or leaks were not evident in the vicinity where these tanks are located. Subsequent to completion of the Phase I ESA, a soil sample was obtained below the fuel tanks. No VOCs were detected.

There is also one large open tank outside near the southeast corner of the mill building. Although identified as an AST, it was possibly used as a thickener in the mill flotation process. The piping arrangement is such that it can be returned to the mill building. Residual material in the tank has leaked through the bottom of the unit and caused material to deposit inside the building along the south basement wall and outside around the base of the unit. The location of the material is identified as M-1 on Figure 3-1. The tank itself is identified as "Pyrite AST" on Figure 1-3. Although the volume was undetermined, samples were obtained during the Phase II ESA to characterize this material. Sample results show elevated concentrations of arsenic, barium, lead and lithium above residential soil cleanup levels.

During site reconnaissance conducted as part of the Phase I ESA investigation, it was also noted that several other smaller ASTs exist in the basement of the mill building. Although contents were not thoroughly investigated due to safety considerations, the tanks may contain residual substances from former mill operations. Subsequent to completion of the Phase I ESA, additional samples were obtained by TriMedia Consultants to more fully characterize materials in the tanks. Results are included in Appendix C.

KEL will remove the Small Oil ASTs as part of rehabilitation of the property and will remove accumulated material along the south basement wall and in the Pyrite AST. KEL will also remove and dispose of other residual materials in observed ASTs in the basement of the mill

building as appropriate. Removal activities will be conducted in accordance with procedures outlined in KEL's Section 7a Due Care Plan. All residuals managed during rehabilitation activities are part of pre-existing conditions at the facility.

### **3.2.2 Underground Storage Tanks**

The Humboldt Mill site once had three USTs located immediately northeast of the office/mill dry building. These tanks included one 12,000 gallon capacity diesel storage tank, one 12,000 gallon capacity heating oil tank and one 4,000 gallon capacity gasoline storage tank. The diesel storage tank and the gasoline tank were removed, while the heating oil tank was decommissioned in place by filling it with concrete. The reason the latter tank was decommissioned in place is that it was located underneath an adjacent building. Releases of product were detected during excavation around the heating oil tank and during removal of the gasoline tank. A confirmed release report was sent to the Michigan State Fire Marshal office in November 1990. Part of the remedial investigation performed in 1992 included installation of nine groundwater monitoring wells and five soil borings. Impacted soil was removed from the site and volatile organic contamination in these soils was removed by use of a low temperature thermal stripper. These activities were described more fully in a report entitled *Preliminary Hydrogeological Investigation*, (SCA, 1992). The location of these USTs is shown on Figure 1-3.

No other USTs have been noted on the Humboldt Mill site and USTs will not be used by KEL.

### **3.2.3 Abandoned or Discarded Barrels, Containers, Other Receptacles, and Residual Materials**

During the Phase I ESA investigation, there were numerous locations inside the buildings on the Humboldt Mill site where containers of chemicals or reagents remained. These observations were described in general in the Phase I ESA report and included the following:

- ♦ Methyl Isobutyl Carbinol – Numerous containers were located along the wall in the old maintenance shop area. This material was supposedly used as a frothing agent, possibly during gold ore processing – see Photograph 30 (Appendix B).
- ♦ Mill Reagents – Approximately 30 containers of mill reagents were noted in a caged area in the center of the mill near the flotation cells. Many of these are identified as “Aero Depressant 633”.
- ♦ Paints and Chemicals – Numerous old containers of paint and chemicals from previous operations were also stored and located in the west end of the shop building. According to MPC, these containers had already been stored in this location when MPC took control of the facility – see Photograph 23 (Appendix B).
- ♦ Laboratory Assay Waste – Two deteriorated fiber drums of material from laboratory assay operations. In the same vicinity are numerous plastic sample bags of similar material – see Photograph 21 in Appendix B.

Since completion of the Phase I ESA, the above materials have been characterized and sent off-site for disposal by Veolia Environmental Services.

Other open drums or containers were also noted throughout the facility. These included items such as the following:

- ♦ Empty steel drums at the west end of the mill building – see Photograph 6 in Appendix B. (These were first observed in 2006; they have since been removed from the site).
- ♦ Drums and debris under cover adjacent to the mill building – see Photograph 7 in Appendix B.
- ♦ Open bins and supersacks of dry materials in the maintenance shop area – see Photograph 18 in Appendix B.
- ♦ Sealed drums on pallets and additional supersacks of dry materials stored in the crusher plant building northwest of the office/mill dry building – see Photograph 29 in Appendix B.

In addition to containers noted above, several piles of residual materials from former mill process operations were observed inside the mill buildings. These included pyrite materials removed from the former pyrite stockpile area (see Section 4.1.4) as well as other small piles of residual materials located throughout the facility. As part of the Phase II ESA, numerous containers and other residual materials inside the buildings were sampled. In general, all materials exhibit some degree of elevated metals. This is not surprising given materials are from previous facility metal processing operations. The location of these sample locations are shown on Figure 3-1. Sample results for container and residual material sampling obtained as part of the Phase II ESA are shown in Table 3-2.

In addition to data obtained as part of the Phase II ESA, subsequent samples were collected by TriMedia Consultants from on-site containers and residual materials to further characterize materials in preparation for removal and disposal. These data provide additional information with respect to Part 201 generic cleanup criteria and screening levels for residual materials associated with pre-existing conditions. Tables showing the results of this sampling event and site maps depicting sample locations are provided in Appendix C.

As part of site rehabilitation, KEL will characterize, remove and dispose of remaining containers and residual materials. All removal activities will be conducted in accordance with procedures outlined in KEL's Section 7a Due Care Plan. All residuals managed during rehabilitation activities are part of pre-existing conditions at the facility.

As part of this BEA, KEL is seeking exemption from liability for hazardous substances that may be contained in discarded or abandoned containers at the Humboldt Mill site. KEL will not use any of the reagents or chemicals currently stored in containers at the site. As part of fulfilling these requirements, the form *Notice Regarding Discarded or Abandoned Containers* (EQP4476) is included in Appendix A. The form provides more detailed information on known information for the above identified containers. The locations of identified containers are depicted on Figure 3-2 and referenced by location number on the form.

### **3.2.4 Fuel Oil AST Located Off-Site**

Just east of the mill buildings off the Humboldt Mill site is a large pad in the vicinity of the former pellet plant foundation. According to information obtained during the Phase I ESA, this pad was previously used for a fuel oil storage tank. It is not clear from past reports and other information when the tank may have been removed. The historical location of the "Fuel Oil AST" is identified on Figure 1-3. Soil samples from beneath the former AST location showed no hydrocarbon concentrations that exceed R 299.5746 Soil Drinking Water Protection Criteria (DWPC). In addition, a groundwater sample showed no hydrocarbon concentrations above R 299.5744 Residential Groundwater Drinking Water Criteria (DWC).

### **3.2.5 PCBs**

Historical wipe sampling has shown evidence of PCBs in four locations in the main mill and one location at the former secondary crusher area. These sample locations are shown on Figure 4 in the Phase I ESA.

While the exact locations of these sample points have not been verified, past site investigations have indicated all PCB equipment has been removed from the site. During the Phase II ESA, two RECs were observed and followed up with PCB sampling. Sampling included oil stains in the motor control room (M-2 east and M-2 west) and brown congealed material on the outside of an inside building (M-6). Oil stains in the motor control room were below EPA PCB cleanup criteria, while a sample of the brown material exceeded cleanup levels cited in EPA's PCB Cleanup Policy based on regulations in 40 CFR 761. These sample locations are shown on Figure 3-1 with results provided in Table 3-2. Follow-up sampling by TriMedia Consultants suggests the source of PCBs on the inside building may be from paint material. A copy of the sample results is included in Appendix C.

## **3.3 Identification of General or Specific Location of Known Contamination in Environmental Media**

In accordance with BEA preparation guidance, this section identifies the extent of known contamination on the Humboldt Mill site that is also classified as a hazardous substance. In general, this will include metals and hydrocarbons detected in soils and groundwater that are above residential cleanup criteria.

Most historical environmental sampling data from the Humboldt Mill site has focused on media in and around the mill building structures and areas where outside stockpiles were previously stored. The primary focus of historical sampling was to characterize contamination associated with hydrocarbon releases identified north and south of the office/mill dry building and to characterize metals in former stockpile areas to the south of the mill building and to the west at the Buried Pyrite Trench area. Samples have also been obtained in the past to document presence of PCBs at former transformer locations.

Recent sampling performed in 2006 as part of the Phase II ESA builds upon previous data collected at the site to characterize current conditions and define the vertical and horizontal extent of this contamination. These findings are summarized below and are more fully discussed in the Phase II ESA report.

### **3.3.1 Soil Samples – Metals**

Historical soil sample exceedances for metals at the Humboldt Mill site and adjacent off-site locations are discussed in the Phase II ESA report. Sample results indicate that most historical soil samples for metals were collected in the vicinity of the Buried Pyrite Trench. While other samples were collected north and south of the office/mill dry building and in the former stockpile area, this sampling focused on just certain metals of interest. In the Buried Pyrite Trench area, the following metals were found to exceed Drinking Water Protection Criteria (DWPC) for soil: antimony, arsenic, iron, manganese, nickel, silver, chromium, lead and magnesium. Chromium and lead were also analyzed in soil samples collected outside the office/mill dry building. Both metals were below cleanup levels in these areas. These sample locations and exceedances are shown on Figures 3-6 through 3-14 in the Phase II ESA.

The locations of all soil samples collected in 2006 and associated exceedances are depicted on Figure 5-26 through 5-41 of the Phase II ESA. Results of soil sampling exceedances are also summarized in Table 3-3 of this BEA report. Results show that aluminum, cobalt, iron and manganese were present in every soil sample collected on-site at concentrations that exceed the DWPC for soil.

Other metals detected above the DWPC for soil in and around the Humboldt Mill site included arsenic, antimony, boron, lithium, magnesium and molybdenum. Lead and selenium were detected only in the Buried Pyrite Trench area above DWPC cleanup levels, while nickel and silver were detected in the Buried Pyrite Trench area as well as in soil samples just to the south of the main mill building. Thallium was detected above the DWPC cleanup level in one sample to the west of the office/mill dry building.

Although historical and current soil sample data are available for copper, this metal was not detected above residential cleanup levels in soil on the MPC property.

### **3.3.2 Soil Samples – Inorganics**

Historical soil sampling results indicate that one sample exceeded cyanide DWPC cleanup levels in the vicinity of the former stockpile area just south of the mill building. This sample location was identified as TP-17 and is shown on Figure 3-5 in the Phase II ESA.

More recent sampling in 2006 revealed one soil sample in the vicinity of TP-17 also exceeded DWPC cleanup levels for cyanide. This sample was at KSB-18. An additional sample, KSB-16 at the Buried Pyrite Trench also exceeded the DWPC cleanup level for cyanide. These results are depicted on Figure 5-25 of the Phase II ESA.

### **3.3.3 Soil Samples –Hydrocarbons**

Historical soil sampling results revealed concentrations of 1, 2, 4 – trimethylbenzene, anthracene and phenanthrene above DWPC cleanup levels at one sample location just north of the office/mill dry building identified as PL-4. This sample location was associated with follow-up investigations on leaks from pipe lines connected to former USTs in this area.

More recent soil sampling in 2006 indicates that 1, 2, 4 – trimethylbenzene is still located in this general vicinity at KSB-4 above DWPC cleanup levels. This result is shown on Figure 5-18 of the Phase II ESA. This result is also provided in Table 3-3.

Elevated hydrocarbons were also noted to be present at a location just off-site the mill property. This was in the vicinity of a former process water or storm water discharge point. Concentrations in soil appear to be isolated in this area. The location is shown on Figure 1-3.

### **3.3.4 Groundwater Samples – Metals**

Historical groundwater samples indicate that metal concentrations in wells just south of the office/mill dry area and the main mill buildings exceed the DWC cleanup levels for several the metals analyzed. Wells involved were primarily MW-1 through MW-12, MW-102, MW-103 and MW-104. These include arsenic, lead, cadmium and nickel. Iron and manganese were detected in most groundwater wells at the site (see Figures 3-25 through 3-31 in the Phase II ESA report).

More recent groundwater samples obtained in 2006 indicate arsenic occurs in several wells across the Humboldt Mill site at levels above the DWC, including MW-5, MW-9, MW-10, MW-11, MW-12, MW-103, MW-104, MW-601, KMW-2, KMW-6A and PW-4. Vanadium also was found to occur at levels above DWC cleanup levels at certain wells, including MW-5, MW-11, MW-102, MW-104, PW-1, PW-4, KMW-7 and MW-601. Iron, manganese and aluminum were found to occur in many of the groundwater wells across the site at levels above the DWC cleanup levels. Several additional metals were above acceptable DWC at MW-102, including beryllium, cadmium, chromium, copper, lithium, nickel and zinc. Cobalt was detected above the DWC cleanup level at MW-102 and KMW-7. Results of 2006 groundwater exceedances are shown on Table 3-4. Sample locations and exceedances based on 2006 sampling are also shown on Figures 5-47 through 5-59 in the Phase II ESA report.

### **3.3.5 Groundwater – Inorganics**

Historical groundwater samples show sulfate to be elevated above DWC cleanup levels in wells located just south of the mill buildings, including MW-4, MW-7, MW-102, MW-103 and MW-107. These groundwater data are depicted in Figure 3-24 in the Phase II ESA. Occurrence of this anion appears to be associated with past storage of pyritic materials in this area.

More recent data for sulfate show this anion only occurring in MW-102 near the southeast corner of the mill building and in the Buried Pyrite Trench area. In this area, sulfate was detected above the DWC in KMW-6A and in wells south of the trench at KMW-7 and KMW-9. Elevated sulfate concentrations are not present in downgradient wells such as KMW-5 and PW-2. Since sulfate was not detected in these wells, it does not appear this constituent is migrating off-site. Results of sulfate groundwater exceedances are shown on Table 3-4 and also on Figure 5-46 of the Phase II ESA.

### **3.3.6 Groundwater – Hydrocarbons**

Hydrocarbons were detected historically in MW-5 and MW-104 above DWC cleanup levels for benzene, ethylbenzene, xylenes, 2-methylnaphthalene and acenaphthalene. Naphthalene and phenanthrene were found above cleanup levels only in MW-104. These sample results are shown on Figures 3-16 through 3-22 in the Phase II ESA report.

More recent sampling in 2006 indicates that hydrocarbons were only detected in MW-5 above DWC cleanup levels. Hydrocarbons included benzene, ethylbenzene and xylenes. These results are shown in Table 3-4 in this BEA report and also on Figures 5-42 through 5-44 of the Phase II ESA.

## 4 Likelihood of Other Contamination

Based on requirements of R 299.5907 (4) (j), the purchaser needs to determine the likelihood that other contamination may be present on the property. This assessment is generally performed through completion of a Phase I ESA that meets requirements of ASTM E 1527-05. Additional information would include data obtained through follow-up investigations completed during a Phase II ESA that further characterizes the extent of hazardous substances on the property.

Section 3 of this BEA summarized information regarding known contamination on the Humboldt Mill site related to metals and hydrocarbons in soil and groundwater. Additional information is provided in this section regarding the likelihood of other contamination based on observations and data collected as part of the Phase I and II ESAs.

### 4.1 Areas of Concern

The Phase I ESA provided additional observations regarding RECs at the site. Most of these RECs were further characterized during completion of the Phase II ESA report. Below is a summary of RECs from the Phase I investigation and the results of further characterization during the Phase II ESA. The RECs are grouped into areas of concern as they were presented in the Phase II ESA. All external RECs are displayed on Figure 1-3 of this BEA report. Figure 3-1 shows additional sample locations of RECs primarily inside the mill buildings. Sections 4.1.1 through 4.1.11 below summarize the areas of concern that were identified in the Phase I ESA and were investigated and reported on further in the Phase II ESA. Items noted during the Phase I ESA are denoted by "Observation", while the results of the Phase II investigation are identified by "Results".

#### 4.1.1 Office/Mill Dry Building

The office/mill dry building includes office space, a laboratory and the vehicle maintenance shop. Gasoline and diesel fuel were stored in USTs near the northeast corner of this building and vehicle maintenance took place in the western half of the building. RECs in this area include:

- ♦ Observation: A remediated leaking UST site, containing fuel oil, diesel and gasoline USTs, located north of the building has not been closed.  
Results: An additional soil boring was completed in this area to assess if historical hydrocarbons continue to be an issue (KSB-1). Hydrocarbons were not detected above DWPC cleanup levels and groundwater samples obtained from nearby MW-9 do not exhibit concentrations of hydrocarbons above drinking water protection standards.
- ♦ Observation: A hydrocarbon release was identified in the area just west and south of the maintenance shop area. The source for these hydrocarbons could be mismanagement of waste oil in the shop area.  
Results: As already described in Section 3, additional soil borings were placed in areas to the west of the maintenance shop to determine if soils continue to be impacted from hydrocarbons (KSB-3, KSB-4, KSB-5, KSB-6 and KMW-1). Results show soils in the vicinity of KSB-4 continue to be impacted by hydrocarbons in concentrations above DWPC cleanup levels. Groundwater samples from MW-5 also indicate hydrocarbon impact in this area.

- ♦ Observation: Oil stains on the vehicle maintenance shop floor and the presence of floor drains and cracks in the floor.  
Results: This observation was noted, but investigations focused on potential soil and groundwater impacts immediately outside the building as noted in the previous bullet.
- ♦ Observation: Containers of lab assay waste were noted in the lunchroom of the office/mill dry building. Rainwater has leaked into the area and caused fiber drums to deteriorate and cause staining on the floor.  
Results: A sample of this material was collected during the Phase II ESA. It was identified on Figure 3-1 of this BEA report as Map ID No. 20. Results show the material exceeds TCLP for lead. Subsequently, this material has been properly disposed of by Veolia Environmental Services.

#### 4.1.2 Main Mill Building

The Main Mill Building is the largest building on the property. This building is located between the Office/Mill Dry Building and the remains of the taconite pellet plant. RECs in this area included:

- ♦ Observation: Oil staining was observed on the floor in the motor control center in the Mill Building.  
Results: Wipe samples of stains in this area were obtained during the Phase II ESA to determine if PCBs were present (M-2 west and M-2 east on Figure 3-1). Results indicated that levels were below PCB cleanup levels set forth in the federal PCB Cleanup Policy described at 40 CFR 761. Total PCB concentrations for both samples were slightly elevated at 7.1 and 8.6  $\mu\text{g}/100\text{ cm}^2$ ; however, both samples were below cleanup levels for PCBs at 10  $\mu\text{g}/100\text{ cm}^2$ .
- ♦ Observation: An AST located inside the building, along the east wall contains water with a layer of oil.  
Results: Water in the tank (M-3 on Figure 3-1) was sampled to determine if hydrocarbons were present. Results show all concentrations were below levels of detection.
- ♦ Observation: A brown, congealed material was noted on the outside walls of one of the interior offices in the Mill Building (M-6 on Figure 3-1).  
Results: The material was sampled to determine if PCBs were present. Concentrations were detected above recommended PCB cleanup levels of 1,000  $\mu\text{g}/\text{kg}$ . This issue is discussed more fully in Section 5.5.2 of the Phase II ESA report. Follow-up sampling by TriMedia Consultants suggests that the source of PCBs on the structure may be from paint material. Results are in Appendix C.
- ♦ Observation: An AST located outside of the southeast corner of the Main Mill Building has released finely ground pyrite material onto the lower floor of the Main Mill Building and around the outside base of the unit. This material has spread to the south wall. There is also yellow staining on the ground outside the building where the siding meets the ground. This material may contain hazardous substances of concern.  
Results: This material was identified as M-1 on Figure 3-1. Sample results obtained during the Phase II ESA indicate this material exceeds cleanup criteria for direct contact



for arsenic and lead. Additional samples, obtained by TriMedia Consultants (sample Nos. 4 and 41, Appendix C), confirmed elevated levels of arsenic and lead for direct contact.

- ♦ *Observation:* There are numerous piles or open containers of former process materials stored at several locations within the building. Other materials include remaining mill reagents and laboratory chemicals. Mill reagents and laboratory chemicals have been profiled by Veolia Environmental Services and disposed of off-site at an appropriate facility.

*Results:* Many of the open containers of dry materials were sampled as part of the Phase II ESA investigation. Detailed sample results are discussed in Section 5.5 of the Phase II ESA report. Remaining materials will be characterized and removed as part of site renovation and disposed of properly.

- ♦ *Observation:* There is an accumulation of debris both within the Mill Building complex and around the perimeter. Debris includes such items as used equipment, metal debris, empty steel drums, refractory material and insulation.

*Results:* All remaining equipment, metal debris, empty drums and other materials will be removed from the facility as part of site renovation. Materials will be characterized and disposed of properly.

As part of site renovation, all materials will be characterized, removed, and disposed of in accordance with procedures outlined in KEL's Section 7a Due Care Plan.

#### **4.1.3 Fuel Oil AST**

*Observation:* Review of the historic aerial photographs of the Humboldt Mill site revealed a large AST situated adjacent to the east side of the former taconite pellet plant. During the site inspection, observations noted a sandy area, with sparse vegetation, surrounded by a rectangular berm, to the east of the pellet plant. Soil and groundwater samples were collected in this area to determine if a petroleum release has occurred.

*Results:* Soil samples were obtained in this area as part of the Phase II investigation. Soil samples were collected at KSB-19, MW-601 and HA-1. All results were below DWPC clean-up levels.

#### **4.1.4 Former Pyrite Stockpile Area**

*Observation:* This area is located immediately south of the Main Mill Building. It was used for storage of process materials.

Pyritic gold ore, gold-bearing pyrite concentrate, and pyrite leach residue were stockpiled south of the Main Mill Building and Office/ Mill Dry areas. Previous environmental investigations identified this area as a source of anomalous metals concentrations in soil. Soil samples should be collected in this area to determine if the impacts are still present.

Dissolved metals were also identified in groundwater samples collected in this area in past environmental investigations. Some of the samples identified groundwater with metals concentrations that exceeded MDEQ DWC in this area. Groundwater samples were collected in

this area to determine if the impacts are still present.

Results: Data obtained during the Phase II ESA indicate certain soil samples and groundwater samples in the vicinity that are above soil and groundwater cleanup levels for several metals. Other than concentrations of iron, manganese, cobalt and aluminum, most of these results are isolated across the site. Results are described more fully in Section 5.2 of the Phase II ESA report. As noted above in Section 3, certain groundwater samples from wells in this area were above DWC cleanup levels. The results of groundwater sampling are more fully described in Section 5.3 of the Phase II ESA report.

#### **4.1.5 Buried Pyrite Trench Area**

Observation: Pyritic flotation concentrate was buried in a trench, north of the main access road to the Humboldt Mill site. It was noted during the Phase I ESA that yellow-orange staining of the paved roadway adjacent to the pyrite trench has occurred. Some of the vegetation on the other side of the roadway appears to be stressed. Historical samples collected from this location identified several metals that exceed the concentrations allowed by the DWPC for soil. Soil and groundwater samples were collected in this area to determine if the impacts are still present.

Results: Sampling was performed during the Phase II ESA investigation to provide additional data on metal concentrations within the buried pyrite concentrate area. Groundwater wells were installed upgradient and downgradient of this area. Discussion is provided above in Section 3 and in Section 5.2 and 5.3 of the Phase II ESA. As part of site rehabilitation, pyrite materials at this location will be removed and disposed of in accordance with procedures outlined in KEL's Due Care Plan.

#### **4.1.6 Septic Drainfield and Storm Water Outfall**

Observation: Based on historical records and interviews with MPC, the floor drains were connected to the sanitary sewer which discharged into a drain field south of the mill. During the field inspection, a storm water or process water outfall was identified which formerly discharged into an area adjacent to the septic field. It is unknown whether this discharge point originated from storm water runoff or process water in the vicinity of the mill buildings.

Results: Soil samples were collected during the Phase II investigation to more fully characterize potential contamination in this area. Two hand auger samples (HA-2 and HA-3) collected in this area showed elevated concentrations of certain hydrocarbons. It should be noted that while floor drains and a portion of the drain field are located on the Humboldt Mill site, the outfall and sample points are located south of the mill and on O'Dovero property.

#### **4.1.7 Electrical Substation**

Observation: The absence of PCBs needs to be verified at the electrical substation located above the mill facility. Old PCB warning labels are still affixed to the outside doors, but the doors are still locked. Evidence of spills and/or leaks was not observed.

Results: While past investigative reports have indicated that all PCBs were removed from the Humboldt Mill site, the interior of the building will be inspected once access is obtained.

#### **4.1.8 PCB Transformers**

Observation: The Humboldt Mill site formerly had several PCB containing transformers on-site that were removed and disposed of. Previous sampling has shown evidence of PCB contamination in areas where transformers were located.

Results: Although locations of previous sample locations were not determined, additional sampling for suspected PCBs was conducted as described above in subsection 4.1.2.

#### **4.1.9 Crusher Plant**

Observation: Drums of some grit blast waste and other industrial minerals were observed stacked on pallets in the crusher plant building. There are also numerous piles and other closed containers of process material stored within the building. The largest pile on the east end of the building is pyrite material removed from the former pyrite stockpile area to the south of the Main Mill. Some of these materials may need to be characterized for disposal and/or reuse.

Results: Certain piles of materials, including the pyrite material were characterized during the Phase II ESA. Some of these materials exceed certain DWPC cleanup criteria for soils. As part of site rehabilitation, all residual materials in the crusher plant building will be managed in accordance with the Section 7a Due Care Plan. Additional sample results are available for materials in this area that were obtained by TriMedia Consultants. They are identified as Sample Nos. 1, 2 and 3 in Appendix C.

#### **4.1.10 Iron Ore Concentrate**

Observation: There are two piles of iron ore concentrate located south of the Main Mill Building. These piles are identified on Figure 1-3 of this BEA.

Results: As part of site rehabilitation, these piles, as well as all evidence of iron pellets across the site will be removed and properly disposed of in accordance with KEL's Section 7a Due Care Plan.

#### **4.1.11 Asbestos Assessment**

Observation: As a result of visual observations made during the Phase I ESA and information from previous Phase I ESAs conducted at the site, Foth was authorized to retain an asbestos assessment contractor to conduct a full asbestos evaluation inside buildings at the site. The following sources of Suspect Asbestos-Containing Materials were observed during the site visit:

- ♦ Floor and ceiling tile were observed in the office areas;
- ♦ Insulation in boiler areas and on the piping formerly used to transfer steam to the flotation circuit.

Results: The findings of the asbestos investigation are briefly described in Section 5.6 of the Phase II ESA report, with more details provided in the full report included as Appendix G-5 of the Phase II ESA. All identified asbestos will be abated by KEL as part of site rehabilitation. Abatement will be performed in accordance with procedures described in KEL's Section 7a Due Care Plan.

## 5 Conclusions

According to MDEQ guidance, the purpose of the Conclusions section is to describe how the body of information in the BEA can be used and why it is sufficient to distinguish potential contamination due to new releases from contamination that was existing at the time of the BEA. KEL will not bring hazardous substances onto the site. As such, KEL will rely upon “no significant hazardous substances use” as the means for distinguishing existing contamination from any future releases at the site. Although hazardous substances will be generated during KEL’s intended site rehabilitation/clean-up activities (e.g., lead paint, asbestos, residuals in abandoned containers), these materials are considered part of pre-existing conditions at the site. Furthermore, KEL intends to manage these “generated” materials in accordance with its Section 7a Due Care Plan so as not to exacerbate existing conditions at the site. Discussion in Section 3 has established that the Humboldt Mill site is a “facility” pursuant to MDEQ regulations in that concentrations of metals and hydrocarbons have been documented to be above MDEQ Part 201 cleanup levels. It is also explained that for purposes of site redevelopment and cleanup, significant hazardous substance use will not occur. Given that significant hazardous substance use will not occur, this method will be relied upon to distinguish between existing and new activities at the site.

The likelihood of other contamination was described in Section 4. This section relied upon information developed from the Phase I and II ESAs conducted at the Humboldt Mill site. In addition to metals and hydrocarbons in soil and groundwater, issues related to asbestos and PCBs were also discussed. As described in this section, KEL will remediate areas where these materials have been documented as part of site redevelopment in accordance with its Section 7a Due Care Plan.

From the above discussion, it is concluded that information provided in this BEA will be adequate to distinguish new activities from historical operations. Based on the above information, KEL is disclosing this information to satisfy MDEQ regulations at R 299.5919 and Section 20126 of the NREPA.

KEL has also completed certain MDEQ notices and forms as required by the Part 201 regulations to request this exemption from liability. Forms are as follows:

- ♦ Form EQP 4446 – Disclosure of a Baseline Environmental Assessment
- ♦ Form EQP 4476 – Notice Regarding Discarded or Abandoned Containers
- ♦ Form EQP 4482 – Notice of Migration and Contamination

These forms are included in Appendix A.

## **6 References**

ASTM E 1527-05, 2005, *Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process*.

Foth Infrastructure & Environment, LLC. 2008. *Humboldt Mill – Phase I Environmental Site Assessment for Former Humboldt Mill Site and Adjacent Property*.

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MDEQ. March 1999. *Preparing and Disclosing Baseline Environmental Assessments and Section 7a Compliance Analyses*.

Sundberg, Carlson & Associates, Inc. 1992. *Preliminary Hydrogeological Investigation*.

Sundberg, Carlson & Associates, Inc. 1996. *Baseline Environmental Assessment*, Volumes 1-3.

## Tables

**Table 3-1****Known Hazardous Substances on the Subject Site**

<b>Hazardous Substance</b>	<b>CAS Number</b>	<b>Hazardous Substance</b>	<b>CAS Number</b>	<b>Hazardous Substance</b>	<b>CAS Number</b>
Aluminum	7429-90-5	Magnesium	7439-95-1	1,2,4 -Trimethylbenzene	95-63-6
Antimony	7440-36-0	Manganese	7439-96-5	1,3,5 -Trimethylbenzene	108-67-8
Arsenic	7440-38-0	Molybdenum	7439-98-7	2-Methylnaphthalene	91-57-6
Beryllium	7440-41-7	Mercury	7439-97-6	Anthracene	120-12-7
Boron	7440-42-8	Nickel	7440-02-0	Acenaphthalene	82-32-9
Cadmium	7440-43-9	Silver	7440-22-4	Benzene	71-43-2
Chromium	7440-47-3	Selenium	7782-49-2	Ethylbenzene	100-41-4
Cobalt	7440-48-4	Thallium	7440-28-0	n-Propylbenzene	103-65-1
Copper	7440-50-8	Vanadium	7440-62-2	s-Butylbenzene	135-98-8
Iron	7439-89-6	Zinc	7440-31-5	Naphthalene	91-20-3
Lead	7439-92-1	Sulfate	-----	Phenanthrene	85-01-8
Lithium	7439-93-2	Cyanide	-----	Xylenes	1330-20-7

Prepared by: CED1  
Checked by: AKM





**Table 3-2**  
**Humboldt Mill Project**  
**Mill Building Residual Materials**

[illegible]

**Explanations**

Exceedances are highlighted in the color of the standard that was exceeded.

DCC = R 299.5746 Residential &amp; Commercial I Soil Direct Contact Criteria

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TCF = TCLP Toxic Characteristic Leaching Procedure at 40 CFR 261.24  
PCB = Polychlorinated Biphenyls (see Table 1)  
PCP = Polychlorinated Phenyls (see Table 1)

< = The analyte was not detected at or above the reporting limit.

B = The analyte was detected between the method detection limit

**B** = The analyte was detected between the method detection limit and the reporting limit.

J = Concentration detected equal to or greater than the method detection limit but less than the reporting limit.

mg/kg = milligrams per kilogram

U = The analyte was not detected at or above the reporting limit.

ug/kg = micrograms per kilogram

ug/L = micrograms per liter

Table 3-3  
Humboldt Mill Project  
2006 Soil Exceedances

Event Date	Parameter	Units	Data Level	Location Name	HA-1-BP	HA-2-BP	HA-3-BP	HA-1	HA-2	HA-2 (dup)	HA-3	KMW-1	KMW-2	KMW-3	KMW-4	KMW-5	KMW-6	KMW-6A	KMW-6A (dup)	KMW-7	KMW-9P	KMW-10	KSB-1	KSB-3	KSB-3	KSB-4	KSB-4	
					Field ID	HA-1	HA-2	HA-3	HA-1	HA-2	DUP	HA-3	KMW-1-3-4'	KMW-2-9-9	KMW-3-6-7'	KMW-4P 12'-14'	KMW-5-14'-14_5'	KMW-6-4-9'	KMW-6A-3-4	DUP-10-4	KMW-7 S-1	KMW-9P S-3	KMW-10-0_9-4'	KSB-1-3	KSB-3-1	KSB-3-3,4'-6'	KSB-4-1	KSB-4-4
					Depth (ft)								3-4'	9-9.5	6-7'	12-14'	14-14.5	4-9'	3-4	3-4		9-14'	0.9-4'	3	1	4-6	1	4
6/6/2006	Metal																											
	Arsenic	mg/kg	Tier 1		320	60	32																					
	Nickel	mg/kg	Tier 1		300	34	27																					
	Silver	mg/kg	Tier 1		18	3.4	1.0 <																					
9/12/2006	Metal																											
	Aluminum	mg/kg	Tier 1									5230	7840	8780	15600	4130	1340	2100			5300	3980	3140	18000	19000		21000	
	Antimony	mg/kg	Tier 1									21.9	0.4	0.17	0.19	0.18	0.29	0.35		0.25	0.11	0.12	0.11 B	0.82		0.93		
	Arsenic	mg/kg	Tier 1									2.1	8.9	6.9	5.1	2.1	9.4	12		7.3	4	4.3	4.7	3.6		3		
	Boron	mg/kg	Tier 1									<3.3 U	3.6	3.2	4.8	2.1 J	1.8 J	<3.3 U		<5.4 U	2.1	2.7	12	12		13		
	Cobalt	mg/kg	Tier 1									8.1	7.3	8.2	10.8	6	8.4	8.5		4.9	3.9	4.1	14	9.8		13		
	Iron	mg/kg	Tier 1									28800	17900	23800	46100	9080	69700	30000		45000	11000	11400	27000	25000		27000		
	Lead	mg/kg	Tier 1									13.6	5	3.6	6.1	2.2	889	12000		24	1.3	2	8	7.5		7.7		
	Lithium	mg/kg	Tier 1									6.2	7.8	10.1	14.5	3.9	2.2	2.7		7.8	4.9	4.6	11	3		5.2		
	Magnesium	mg/kg	Tier 1									2370	2780	3840	6210	1430	983	1100		3450	2060	1860	13000	13000		14000		
	Manganese	mg/kg	Tier 1									211	191	441	247	201	298	300		205	71.5	187	470	390		480		
	Molybdenum	mg/kg	Tier 1									<0.33 U	2.7	0.59	2.1	0.43	2.1	3.3		1.5	0.63	1.4	0.87 B	0.71 B		1.0 B		
	Nickel	mg/kg	Tier 1									14	27.8	21.7	33	13.5	29.5	14		22.4	13.2	10.8	32	29		35		
	Selenium	mg/kg	Tier 1									<0.33 U	<0.26 U	<0.25 U	<0.23 U	<0.054 U	<0.27 U	0.3		<0.27 U	<0.23 U	<0.26 U	0.19 B	<0.19 U		<0.20 U		
	Silver	mg/kg	Tier 1									<0.22 U	0.24	0.29	0.12 J	0.9	0.25	0.037 B		<0.11 U	0.63	0.82	<0.014 U	0.5		0.11 B		
	Thallium	mg/kg	Tier 1									<0.44 U	0.056 J	0.065 J	0.11	<0.054 U	<0.054 U	0.011 B		<0.054 U	<0.045 U	<0.051 U	0.071 B	<0.016 U		0.059 B		
	Zinc	mg/kg	Tier 1									20.1	28.8	20.2	58.7	9.3	35.7	19		34.8	11.2	14.4	57	51		56		
	Inorganics																											
	Cyanide, total	mg/kg	Tier 1										<0.16 U	<0.24 U	<0.21 U	<0.37 U	<0.28 U	<0.28 U	<0.17 U		<0.22 U	<0.13 U	<0.26 U	<0.22 U	<0.21 U		<0.31 U	
	VOC																											
		1,2,4-Trimethylbenzene	ug/Kg	Tier 1					<30 U	35000	15000	<23 U	34 J	<21 U										<21 U		<20 U		5600
	1,3,5-Trimethylbenzene	ug/Kg	Tier 1					<14 U	27000	11000	<11 U	<10 U	<10 U										<10 U		<9.9 U		1600	
	n-Propylbenzene	ug/Kg	Tier 1					<16 U	2500	1000	<12 U	67	<11 U										<11 U		<11 U		660	
	s-Butylbenzene	ug/Kg	Tier 1					<13 U	2300	880	<9.7 U	600	<8.9 U										<8.7 U		<8.6 U		520	

Table 3-3  
Humboldt Mill Project  
2006 Soil Exceedances

Event Date	Parameter	Units	Data Level	Location Name	KSB-5	KSB-6	KSB-7	KSB-7	KSB-8	KSB-9	KSB-10	KSB-11	KSB-12	KSB-13	KSB-14	KSB-15	KSB-16	KSB-18	KSB-18 (dup)	KSB-19	KSB-19	KSB-19 (dup)	MW-601	MW-601	MW-603
				Field ID	KSB-5-5_7-8_5'	KSB-6-0-1_6'	KMW-2-9-9	KSB-7-4-5'	KSB-8-0-2	KSB-9-3	KSB-10-3	KSB-11-1	KSB-12-6-9'	KSB-13-S-2	KSB-14-11_5-12'	KSB-15-3_5-4'	KSB-16-0-4	KSB-18-0-4	DUP-10-2	KSB-19-2-4	KSB-19-5'-7'	DUP-10-4A	MW-601-8'-9'	MW-601-8-9	MW-603-14-16
				Depth (ft)	5.7-8.5	0-1.6	9-9.5	4-5	0-2	3	3'	1	6-9	4-9'	11.5-12	3.5-4	0-4	0-4		2-4	5-7		8-9	8-9	14-16
6/6/2006	Metal																								
	Arsenic	mg/kg	Tier 1																						
	Nickel	mg/kg	Tier 1																						
	Silver	mg/kg	Tier 1																						
9/12/2006	Metal																								
	Aluminum	mg/kg	Tier 1		5960	5570		16000	2000	1910	2250	4580	5170	3270	17900	10800	8000	2000	1100	8400		9500		9000	2900
	Antimony	mg/kg	Tier 1		13.7	36.8		0.34	37	54.7	65.3	79.1	0.33	27.8	0.044 J	0.18	180	2.6	2	0.31		0.36		0.36	0.13
	Arsenic	mg/kg	Tier 1		1.1	<0.28 U		23.7	39	<0.28 U	13.3	<0.3 U	9.2	150	2.7	2.8	420	15	15	5.1		5		11	5.3
	Boron	mg/kg	Tier 1		<3.2 U	<3.7 U		13.1	<3.5 U	<3.7 U	<3.6 U	<4 U	4.3	5.3	3.8	2.6	<3.9 U	<3.7 U	<3.6 U	<3.7 U		<3.7 U		<3.6 U	3.5
	Cobalt	mg/kg	Tier 1		10.4 OQS	8.2		28.5	11	8.7	4.5	8.6	6.5	103	19.8	12.6	260	4.1	2.5	5.7		7.2		7.3	4.5
	Iron	mg/kg	Tier 1		20100	61200		60300	33000	77600	104000	123000	59100	102000	31800	34600	200000	24000	22000	15000		18000		20000	36609
	Lead	mg/kg	Tier 1		9.2	14.6		9.4	110	12.2	10.7	51.2	8.6	282	3.9	5.4	330	14	7.8	3.2		3.2		5.2	1.2
	Lithium	mg/kg	Tier 1		5.6	4.8		18.4	4.6	0.97	1.4	6	7.2	3.9	29.4	15.6	6.6	3.1	4.2	7.9		7.5		9.6	3.5
	Magnesium	mg/kg	Tier 1		2060	1880		7590	2500	632	1060	3650	2620	4270	12700	7600	10000	1200	580	3500		4200		4600	890
	Manganese	mg/kg	Tier 1		7830	283		637	63	331	204	2570	323	99.4	321	265	120	97	69	180		200		270	98.2
	Molybdenum	mg/kg	Tier 1		<0.32 U	<0.37 U		9.6	55	<0.37 U	<0.36 U	<0.4 U	1.3	111	0.63	2.2	220	5.4	2.8	0.50 B		0.41 B		1.4	0.75
	Nickel	mg/kg	Tier 1		22	13.8		104	66	31.4	11.8	53.8	17.7	223	54.9	49.7	740	11	6.7	14		14		20	11.3
	Selenium	mg/kg	Tier 1		3.2	<0.37 U		0.35 J	0.95	<0.37 U	<0.36 U	<0.4 U	<0.27 U	3	<0.22 U	<0.25 U	6.2	0.31	0.3	0.18		0.19		0.23	<0.3 U
	Silver	mg/kg	Tier 1		1.4	<0.25 U		0.23	9.3	0.5	0.3 J	1.1	0.98	17	0.71	0.25	36	0.68	0.47	0.041 B		0.063		0.045 B	0.23 J
	Thallium	mg/kg	Tier 1		3.3	<0.49 U		0.3	0.027 B	<0.5 U	<0.48 U	<0.54 U	<0.053 U	0.046 J	0.23	<0.05 U	0.069 B	<0.0067 U	<0.0066 U	0.049 B		0.068 B		0.096 B	<0.059 U
	Zinc	mg/kg	Tier 1		29.7	30.2		153	52	52.3	12.2	109	20.7	49.2	40.5	58.2	170	13	8.7	19		23		35	6.1
	Inorganics																								
	Cyanide, total	mg/kg	Tier 1		<0.21 U	<0.16 U		<0.20 U	2.9	<0.16 U	<0.15 U	0.44	<0.29 U	<0.21 U	<0.22 U	0.27 B	37	14	12	<0.26 U		<0.20 U		<0.23 U	<0.26 U
	VOC																								
	1,2,4-Trimethylbenzene	ug/Kg	Tier 1		<22 U	<21 U		<21 U							<21 U	730					<21 U		<21 U		
	1,3,5-Trimethylbenzene	ug/Kg	Tier 1		<11 U	<10 U		<10 U							<10 U	210					<10 U		<10 U		
	n-Propylbenzene	ug/Kg	Tier 1		<12 U	<11 U		<11 U							<11 U	120					<11 U		<11 U		
	s-Butylbenzene	ug/Kg	Tier 1		<9.4 U	<8.9 U		<8.9 U							<9.0 U	79					<8.7 U		<8.8 U		

Table 3-3  
Humboldt Mill Project  
2006 Soil Exceedances

Event Date	Parameter	Units	Data Level	Location Name	MW-606	P-602	P-604	SB-607	SB-608	SB-609	SB-609	SB-610A	SB-611	SB-612	SB-613	SB-614	SB-615	SB-616	SB-617	SB-618	SB-618 (dup)	SB-619	SB-620	SB-621
				Field ID	MW-606-14-16	P-602-14-16	P-604-9-14	SB607S-2,2'-2_9'	SB608S-2,2'-3_1'	SB-609-14-16	SB-609-S-8	SB-610A-S-5A	SB-611-S-3	SB-612-S-3	SB-613-S-4	SB-614-S-4	SB-615-S-6	SB-616-2-4	SB617-4-7'	SB-618-8-9	DUP-10-3	SB-619-3-9	SB-620 S-4	SB-621 S-3
				Depth (ft)	14-16	14-16	9-14	2-2.9	2-3.1	14-16	14-16	12-14	4-6	4-6	6-8	6-8	10-12	2-4	4-7	8-9		3-9	19-21	14-16
6/6/2006	Metal																							
	Arsenic	mg/kg	Tier 1																					
	Nickel	mg/kg	Tier 1																					
	Silver	mg/kg	Tier 1																					
9/12/2006	Metal																							
	Aluminum	mg/kg	Tier 1		2200	2400	11000	10000	9600		7890	4530	4460	3190	9700	6070	2620	11000	1940	10000	7800	1600	3280	1340
	Antimony	mg/kg	Tier 1		0.099 B	0.11 B	0.38	0.34	0.25 B		26	7.7	6.5	20.8	18.7	9.9	50.6	0.3	0.067 J	0.24	0.27	0.32	<0.081 U	<0.049 U
	Arsenic	mg/kg	Tier 1		0.94	0.71	6.4	2.3 B	25		8.2	<0.32 U	0.37 J	<0.25 U	4.2	<0.3 U	<0.3 U	2.7	0.75	5	5.7	1.7	1.3	0.83
	Boron	mg/kg	Tier 1		<4.0 U	<4.4 U	<4.1 U	3.3 B	4.4 B		<3.6 U	<4.3 U	<3.5 U	<3.4 U	<3.7 U	<4 U	<4 U	9.6 B	5.7	<3.6 U	<3.6 U	<3.5 U	4.6	2.9
	Cobalt	mg/kg	Tier 1		3.2	3	9.6	9.9	5.8		9.8	3.6	3.1	3.8	6.4	5.1	8.3	18	2	8.3	7	1.8	3.6	1.9
	Iron	mg/kg	Tier 1		16000	12000	33600	28000	32000		32000	9280	7890	25000	20400	10700	64300	33000	12800	21000	16000	14000	20700	15600
	Lead	mg/kg	Tier 1		1	0.77	4	4.2	9.2		5.3	3.2	3.7	5.1	6.1	4.2	11.4	2.2	2.2	3	2.8	1.9	1.2	1.5
	Lithium	mg/kg	Tier 1		4.8	6.3	18	4.3	16		4.4	1.1	2.1	0.81	5.5	3.3	3.2	23	5.1	7.8	8.6	4.2	6.5	4.2
	Magnesium	mg/kg	Tier 1		1200	1100	5900	6000	5300		5010	1530	1350	1400	3330	1830	1680	7100	864	5200	4200	800	1390	757
	Manganese	mg/kg	Tier 1		160	130	170	320	210		403	79.5	60.1	122	216	125	360	480	33	380	460	77	152	78.5
	Molybdenum	mg/kg	Tier 1		0.87 B	0.76 B	1.2 B	0.96 B	4.4		<0.36 U	<0.43 U	<0.35 U	<0.34 U	<0.37 U	<0.4 U	<0.4 U	0.57 B	1.2	0.54 B	0.66 B	1.3	0.55	0.44
	Nickel	mg/kg	Tier 1		12	9.3	36	19	33		18	11.6	8.4	8.3	18.4	10.4	16.3	27	5.8	18	16	6.2	9.6	4.7
	Selenium	mg/kg	Tier 1		0.29	0.42	<0.086 U	<0.21 U	<0.18 U		<0.36 U	<0.43 U	<0.35 U	<0.34 U	<0.37 U	<0.4 U	<0.4 U	0.2	0.23 J	0.21	0.24	0.17	<0.31 U	<0.24 U
	Silver	mg/kg	Tier 1		0.034 B	0.041 B	0.010 B	0.061 B	0.024 B		<0.24 U	<0.29 U	<0.23 U	<0.23 U	<0.26 U	<0.26 U	<0.27 U	0.037 B	0.17	0.025 B	0.032 B	0.065	0.14 J	0.18 J
	Thallium	mg/kg	Tier 1		<0.0074 U	<0.0080 U	0.16	0.070 B	0.14 B		<0.48 U	<0.58 U	<0.47 U	<0.45 U	<0.5 U	<0.53 U	<0.53 U	0.047 B	<0.041 U	0.074 B	0.081 B	<0.0063 U	<0.061 U	<0.049 U
	Zinc	mg/kg	Tier 1		9.9	12	26	50	29		28.9	11.9	17.1	18.8	17.5	14.3	10.6	24	2.7 J	27	22	4.9	7.9	5.1
	Inorganics																							
	Cyanide, total	mg/kg	Tier 1		<0.21 U	<0.25 U	<0.15 U	<0.21 U	<0.27 U		<0.25 U	<0.31 U	<0.30 U	<0.22 U	<0.26 U	<0.28 U	<0.17 U	<0.27 U	<0.22 U	<0.17 U	<0.28 U	<0.20 U	<0.23 U	<0.16 U
	VOC																							
	1,2,4-Trimethylbenzene	ug/Kg	Tier 1																					
	1,3,5-Trimethylbenzene	ug/Kg	Tier 1																					
	n-Propylbenzene	ug/Kg	Tier 1																					
	s-Butylbenzene	ug/Kg	Tier 1																					

Table 3-3  
Humboldt Mill Project  
2006 Soil Exceedances

Event Date	Parameter	Units	Data Level	Location Name	SB-622	SB-622 (dup)	SB-623	SB-624	SB-625	SB-626	SB-627	SB-628	SB-628	SB-629	SB-630	SB-631	SB-632	SB-633	SB-634	SB-635	SB-636	SB-637	SB-637 (dup)	SB-638	
					Field ID	SB-622-S-2	DUP-15	SB-623-S-3	SB-624-0-4	SB-625-1-3	SB-626 S-3	SB627-24-26'	SB628-14-16'	SB628-29-31'	SB-629 14-16'	SB-630 14-16'	SB-631 14-16'	SB-632-14-16'	SB-633-5-7'	SB-634-14-16'	SB-635 S-3	SB-636-4-6'	SB-637-S-7	DUP-13	SB-638 9'-11'
					Depth (ft)	2-9	2-9	S-3	0-4	1-3	14-16	24-26	14-16	29-31	14-16	14-16	14-16	14-16	5-7	14-16	14-16	4-6	12-14		9-11
6/6/2006	Metal																								
	Arsenic	mg/kg	Tier 1																						
	Nickel	mg/kg	Tier 1																						
	Silver	mg/kg	Tier 1																						
9/12/2006	Metal																								
	Aluminum	mg/kg	Tier 1		4500	4700	3000	3800	5500	1710	2450	5640	1800	1920	3570	3530	2750	2380	4140	4140	2780	3920	3400	3630	
	Antimony	mg/kg	Tier 1		18.8	0.61	17.1	0.36	0.11	0.072 J	0.047 J	0.27	0.051 J	0.1 J	0.074 J	0.06 J	0.11 J	22	31.5	0.12	0.059 J	46.2	0.29	0.072 J	
	Arsenic	mg/kg	Tier 1		<0.28 U	3.8	<0.29 U	5.8	2.2	5	1.1	2.6	0.94	1.3	1.5	0.8	0.92	<0.27 U	<0.3 U	1.5	1	<0.32 U	1.2	0.98	
	Boron	mg/kg	Tier 1		<3.7 U	<3.4 U	<3.8 U	<3.7 U	<3.4 U	6.1 J	6.1	4.6	2.8	1.6 J	5.8	6.7	2.5	<3.6 U	<4.1 U	2.8	1.3 J	<4.2 U	4.2 B	<5.7 U	
	Cobalt	mg/kg	Tier 1		4.8	8.6	2.4	8.1	9.6	5.4	2.7	8	2.8	3.8	4	7.3	4.7	2.9	5.1	5.3	3.4	5.5	3.8	4.8	
	Iron	mg/kg	Tier 1		21500	16000	20900	20000	17000	29000	26000	79900	19600	37100	33500	28400	40800	29100	43500	51700	26800	56300	27000	25100	
	Lead	mg/kg	Tier 1		4.6	5.5	3.6	8.1	2.5	1.4	1.4	5.1	1.2	1.8	1.1	1.2	1.6	3.2	4.4	4.4	1.3	6.6	1.2	0.93	
	Lithium	mg/kg	Tier 1		16.3	19	1.5	6.4	11	5.9	6.8	9.4	5.3	4.6	7.2	7.7	5.8	3.7	5.8	7.5	3.9	7.9	6	8.2	
	Magnesium	mg/kg	Tier 1		2010	2800	1200	1900	2800	1100	1330	2830	1020	1180	2210	2200	1450	1220	2090	2020	1300	2070	1700	1850	
	Manganese	mg/kg	Tier 1		120	170	110	230	290	87.1	131	333	127	184	334	274	211	158	241	253	164	245	210	178	
	Molybdenum	mg/kg	Tier 1		<0.37 U	0.56 B	<0.38 U	1.2	0.98 B	0.76	1	2.3	0.58	1.1	0.95	1.2	1.1	<0.36 U	<0.41 U	2	0.79	<0.42 U	0.55 B	0.5	
	Nickel	mg/kg	Tier 1		11.2	17	5.8	14	16	13.1	7.8	43.1	6.9	15.9	10.1	27.1	19.2	6.6	10	27	7.5	24.8	9.5	10	
	Selenium	mg/kg	Tier 1		<0.37 U	0.32	<0.38 U	0.2	0.24	<0.26 U	<0.23 U	0.35 J	0.29 J	<0.3 U	<0.26 U	<0.3 U	<0.31 U	<0.36 U	<0.41 U	<0.3 U	<0.26 U	<0.42 U	0.19	<0.29 U	
	Silver	mg/kg	Tier 1		<0.25 U	0.06	<0.26 U	0.031 B	0.15	0.12 J	0.2	0.69	0.12 J	0.54	0.2 J	0.14 J	0.29	<0.24 U	<0.27 U	<0.12 U	0.11 J	<0.28 U	0.045 B	0.76	
	Thallium	mg/kg	Tier 1		<0.49 U	0.042 B	<0.51 U	0.036 B	0.041 B	<0.053 U	<0.045 U	<0.053 U	<0.05 U	<0.061 U	<0.052 U	<0.06 U	<0.061 U	<0.48 U	<0.54 U	<0.059 U	<0.052 U	<0.56 U	0.015 B	<0.057 U	
	Zinc	mg/kg	Tier 1		12.8	23	10	36	24	10.3	7.9	16	10.5	11.2	23.1	18.2	11.1	9.8	10.8	16.6	7.7	11.1	12	8.7	
	Inorganics																								
	Cyanide, total	mg/kg	Tier 1		<0.23 U	<0.18 U	<0.21 U	<0.15 U	<0.21 U	<0.25 U	<0.26 U	<0.37 U	<0.25 U	<0.34 U	<0.22 U	<0.25 U	<0.30 U	<0.30 U	<0.23 U	<0.35 U	<0.31 U	<0.31 U	<0.33 U	<0.31 U	
	VOC																								
	1,2,4-Trimethylbenzene	ug/Kg	Tier 1																						
	1,3,5-Trimethylbenzene	ug/Kg	Tier 1																						
	n-Propylbenzene	ug/Kg	Tier 1																						
	s-Butylbenzene	ug/Kg	Tier 1																						

Table 3-3  
Humboldt Mill Project  
2006 Soil Exceedances

Event Date	Parameter	Units	Data Level	Location Name	SB-639	SB-639	SB-640	SB-640 (dup)	SB-641	SB-642	SB-643	SB-644	SB-645	SB-647	SB-648	Drinking Water Protection (DWPC)
				Field ID	SB-639 14-16'	SB-639-19-21'	SB-640-14-16'	DUP-9-26	SB-641-19-21'	SB-642-34-36'	SB-643 14'-16'	SB-644-S-4	SB-645-4-6	SB-647-4-6	SB-648-4-6	
				Depth (ft)	14-16	19-21	14-16		19-21	34-36	14-16	12-15	4-6	4-6	4-6	
6/6/2006	Metal															
	Arsenic	mg/kg	Tier 1													10
	Nickel	mg/kg	Tier 1													100
	Silver	mg/kg	Tier 1													25
9/12/2006	Metal															
	Aluminum	mg/kg	Tier 1		3050	7010	2880	2900	1860	2020	2380	2850	3600	5900	2900	10
	Antimony	mg/kg	Tier 1		<0.06 U	0.45	0.11	0.10 B	0.089 J	<0.057 U	0.085 J	25.4	0.17	0.19	0.17	4.3
	Arsenic	mg/kg	Tier 1		0.72	4	0.95	1	0.91	0.49	1.2	<0.32 U	1.6	8	1.2	30
	Boron	mg/kg	Tier 1		4.6 J	9.7	2.9	<4.3 U	2 J	6.3	<6 U	<4.3 U	<3.8 U	<3.5 U	<3.5 U	18
	Cobalt	mg/kg	Tier 1		4.1	11	4	3.3	2.6	2.3	3.7	3.7	3.8	4.9	3.5	0.8
	Iron	mg/kg	Tier 1		22900	118000	24100	18000	30900	26600	38200	29100	25000	19000	21000	10
	Lead	mg/kg	Tier 1		1.2	6.6	1.2	1	2.5	1.2	1.7	3.4	1.2	2	1.7	20
	Lithium	mg/kg	Tier 1		7	18.2	5.7	5.3	5	6.6	5.4	3.4	6.5	5.3	4.2	3.6
	Magnesium	mg/kg	Tier 1		1820	3590	1790	1700	1150	1220	1360	1360	2000	3000	1500	600
	Manganese	mg/kg	Tier 1		214	410	216	220	130	104	167	174	210	220	240	200
	Molybdenum	mg/kg	Tier 1		0.56	2.9	0.7	0.84 B	0.94	0.84	0.88	<0.43 U	0.72 B	0.83 B	0.72 B	15
	Nickel	mg/kg	Tier 1		11.4	60.7	11.2	9.7	9.7	6.5	17.5	8.6	8.1	12	7.7	10
	Selenium	mg/kg	Tier 1		<0.3 U	<0.35 U	<0.27 U	0.23	0.33 J	<0.29 U	<0.3 U	<0.43 U	0.17	0.23	0.17	4
	Silver	mg/kg	Tier 1		<0.12 U	1.1	0.33	0.087	0.24	0.18 J	0.21 J	<0.29 U	0.024 B	0.07	0.031 B	2
	Thallium	mg/kg	Tier 1		<0.06 U	<0.07 U	<0.053 U	0.013 B	<0.054 U	<0.057 U	<0.08 U	<0.57 U	0.0095 B	0.040 B	0.011 B	20
	Zinc	mg/kg	Tier 1		10.6	19.1	11.2	11	7.9	5.7	10	8.5	11	15	12	2200
	Inorganics															
	Cyanide, total	mg/kg	Tier 1		<0.36 U	<0.33 U	<0.32 U	<0.36 U	<0.22 U	<0.37 U	<0.35 U	<0.35 U	<0.28 U	<0.31 U	<0.21 U	40
	VOC															
	1,2,4-Trimethylbenzene	ug/Kg	Tier 1													2400
	1,3,5-Trimethylbenzene	ug/Kg	Tier 1													1600
	n-Propylbenzene	ug/Kg	Tier 1													1600
	s-Butylbenzene	ug/Kg	Tier 1													1600

Notes:  
mg/kg = milligrams/kilogram  
ug/kg = micrograms/kilogram  
B = Inorganic - the analyte has been detected between the method detection limit and the reporting limit  
J = All concentration detected equal to or greater than the method detection limit but less than the reporting limit  
VOC = Volatile organic compound  
U = The analyte was not detected at or above the method detection limit.  
Dup = duplicate  
Results were compared to the MDEQ drinking water protection criteria. Exceedances are highlighted in yellow.  
DWPC = 10-299-5746 Residential & Commercial Soil Drinking Water Protection Criteria - MDEQ Part 201 Groundwater Cleanup and Section 106 Levels

Table 3-4  
Humboldt Mill Site  
November 2006 Groundwater Exceedences

Event Date	Parameter	Units	Data Level	Well ID	KMW-1	KMW-2	KMW-5	KMW-6A	KMW-7	KMW-7 (dup)	KMW-9P	MW-101	MW-102	MW-103	MW-104	MW-11	MW-12	MW-12 (dup)	MW-5	MW-501	MW-9	PW-1	PW-1 (dup)	PW-4	Residential/Commercial/Drinking Water Criteria (DWC)	
				Collection Date	11/8/2006	11/8/2006	11/8/2006	11/15/2006	11/8/2006	11/8/2006	11/8/2006	11/2/2006	11/9/2006	11/2/2006	11/9/2006	11/2/2006	11/2/2006	11/2/2006	11/6/2006	11/8/2006	11/6/2006	11/6/2006	11/6/2006	11/6/2006		
				Screen Interval (ft msl)	1582.2-1572.2	1581.4-1571.4	1553.5-1543.5	1550.8-1550.8	1550.4-1550.4	1550.4-1550.4	1527.6-1522.6					1587.03-1582.03	1581.37-1576.37	1581.37-1576.37	1579.21-1574.21	1597.1-1587.1	1589.89-1584.89					
11/2/2006																										
	Metal																									
	Aluminum	ug/L	Tier 1		62	16 B	8.9 B	26 B	23 B	26 B	<6.3 U	37 B	400000	13 B	80	430	19 B	8.2 B	360	58	7.0 B	130	130	230	50	
	Arsenic	ug/L	Tier 1		7.9	24	0.95 B	12	4.4	4.6	3.4	31	5800	14	28	18	10	10	160	26	29	3.1	3.2	93	10	
	Beryllium	ug/L	Tier 1		<0.10 U	<0.10 U	<0.10 U	<0.10 U	0.18 B	0.18 B	<0.10 U	<0.10 U	29	<0.10 U	<0.10 U	0.18 B	<0.10 U	<0.10 U	<0.10 U	0.12 B	<0.10 U	<0.10 U	<0.10 U	<0.10 U	4	
	Cadmium	ug/L	Tier 1		<0.14 U	<0.14 U	<0.14 U	<0.14 U	<0.14 U	<0.14 U	<0.14 U	<0.14 U	49	<0.14 U	<0.14 U	<0.14 U	<0.14 U	<0.14 U	<0.14 U	<0.14 U	<0.14 U	<0.14 U	<0.14 U	<0.14 U	5	
	Chromium	ug/L	Tier 1		2.2	<0.32 U	0.69 B	2	1.6	1.8	0.87 B	1.8	8000	1.4	2.9	8.9	0.91 B	0.36 B	10	2.6	<0.32 U	2.2	2.3	5.5	100	
	Cobalt	ug/L	Tier 1		3.4	1.3	67	14	120	120	17	0.22 B	6400	0.31 B	0.19 B	12	0.27 B	0.27 B	5.5	9.2	1.5	0.12 B	0.10 B	1.1	40	
	Copper	ug/L	Tier 1		0.33 B	<0.15 U	1	0.33 B	0.22 B	0.31 B	0.25 B	0.23 B	10000	<0.15 U	0.3 B	2.2	<0.15 U	<0.15 U	2.3	1	5.1	0.2 B	0.17 B	0.57 B	1000	
	Lithium	ug/L	Tier 1		0.63	2	10	0.63	4.9	4.8	5.9	0.63	450	1	1	1.8	1.6	1.5	0.33	1	1.4	0.056	0.089 B	0.4	170	
	Nickel	ug/L	Tier 1		1.1	1.5	7.4	44	84	85	1.5	0.41 B	14000	0.47 B	0.91 B	2.4	0.4 B	<0.32 U	24	8.5	2.7	<0.32 U	<0.32 U	3.4	100	
	Vanadium	ug/L	Tier 1		4.2	0.69 B	0.48 B	3.2	4.8	4.9	1.2	3.5	220	2.6	4.6	16	1.2	0.97 B	21	5	0.76 B	5.2	5.3	11	25	
	Zinc	ug/L	Tier 1		5.6 B	5.8 B	10	7.6 B	9.1 B	13	5.4 B	2.9 B	5800	<0.99 U	11	8.5 B	<0.98 U	<0.98 U	6.8 B	12	7.8 B	5.3 B	5 B	5.2 B	2400	
	Inorganics																									
	Nitrogen, Ammonia	mg/L	Tier 1		0.87	0.46 B	<0.20 U	1.6	1.8	1.8	1.3	2.1	<0.50 U	1.4		22	0.84	0.89	19	6.9	0.33 B	0.89	0.95	4.9	10	
	Sulfate	mg/L	Tier 1		7.9	61	91	360	750	750	850	1.5 B	13000	170		<0.77 U	12	12	1.4 B	15	51	19	19	3.7 B	200	
	Volatile Aromatic Hydrocarbons																									
	Benzene	ug/L	Tier 1		<0.41 U	<0.41 U	<0.41 U	<0.41 U	<0.41 U	<0.41 U	<0.41 U	<0.41 U	<0.41 U	<0.41 U	0.65 J	<0.41 U	<0.41 U	<0.41 U	16	<0.41 U	<0.41 U	<0.41 U	<0.41 U	<0.41 U	74	
	Ethylbenzene	ug/l	Tier 1		<0.54 U	<0.54 U	<0.54 U	<0.54 U	<0.54 U	<0.54 U	<0.54 U	<0.54 U	<0.54 U	<0.54 U	3.2	<0.54 U	<0.54 U	<0.54 U	90	<0.54 U	<0.54 U	<0.54 U	<0.54 U	<0.54 U	74	
	Xylenes	ug/l	Tier 1		<2.8 U	<2.6 U	<2.6 U	<2.6 U	<2.6 U	<2.6 U	<2.6 U	<2.6 U	<2.6 U	<2.6 U	27	<2.6 U	<2.6 U	<2.6 U	1400	<2.6 U	<2.6 U	<2.6 U	<2.6 U	<2.6 U	280	
Notes:																										

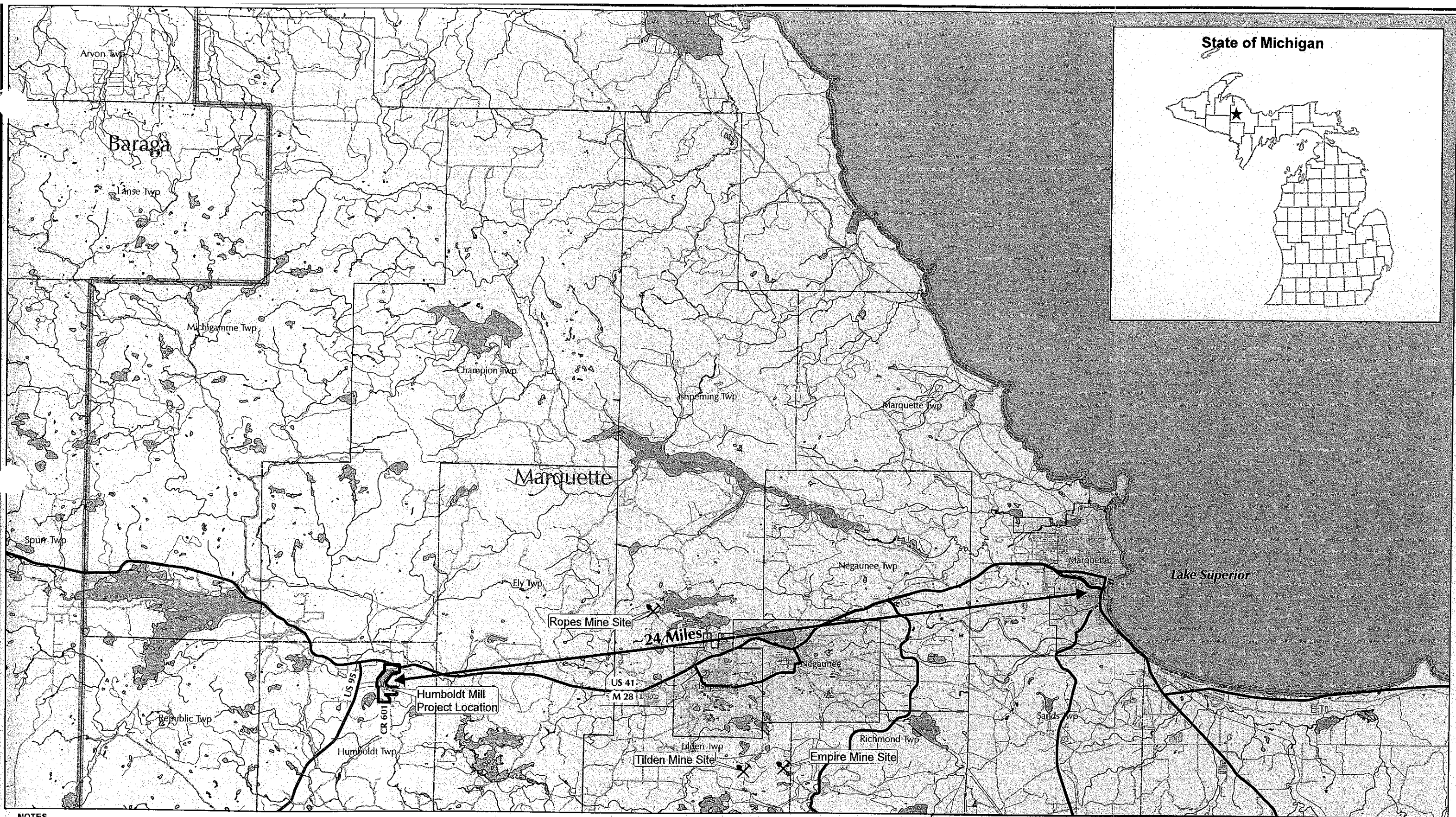
Notes:

ft = feet  
msl = mean sea level  
B = Inorganic - The analyte has been detected between the method detection limit and the reporting limit  
U = All - The analyte was not detected at or above the reporting limit.  
dup = duplicate  
mg/l = milligrams/liter  
ug/l = micrograms/liter

Results were compared to the residential/commercial drinking water criteria. Exceedences are highlighted in yellow.  
DWC = R 203.6744 Residential/Commercial Drinking Water Criteria; MDEQ P&T 201 generic cleanup and screening levels.

## Figures



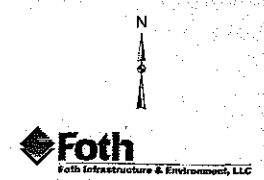


**NOTES**

1. Horizontal datum based on NAD 83/94.  
Horizontal coordinates based on UTM Zone 16.
2. All base information downloaded from Michigan Center of Geographic Information (<http://www.michigan.gov/cgi>).
3. Site Location - Project Site within Section 2 and 11, T47N, R29W, Humboldt Township, Marquette County, Michigan.

**LEGEND**

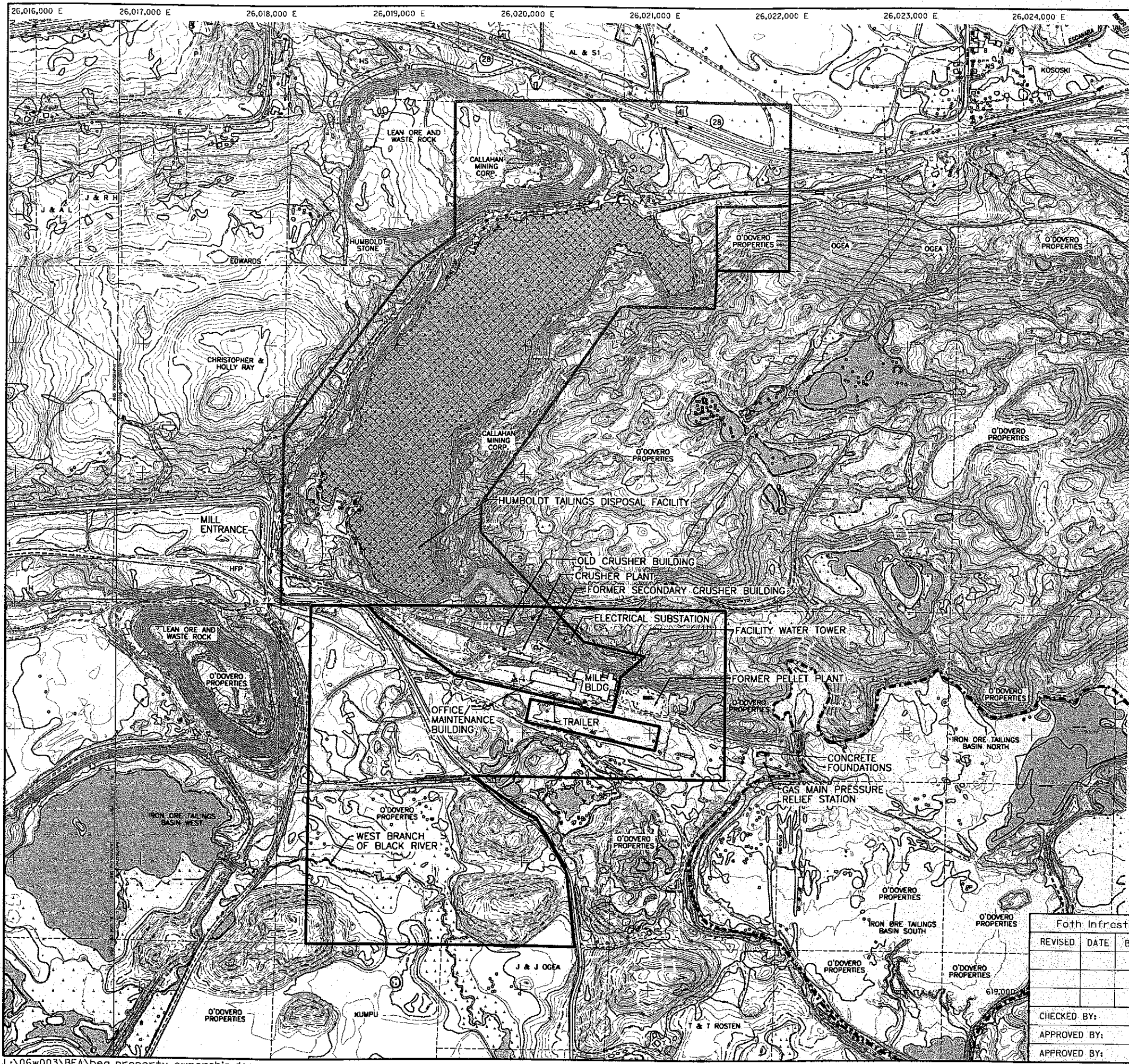
	Counties		Highways
	Minor Civil Divisions		Major Roads
	Lakes and Rivers		Minor Roads
	Property purchased by or to be purchased by Kennecott		



Foth Infrastructure & Environment, LLC			
REVISED	DATE	BY	DESCRIPTION
CHECKED BY:		CED1	DATE: AUG. '08
APPROVED BY:		AKM	DATE: AUG. '08
APPROVED BY:			DATE:

<b>Kennecott</b> Eagle Land, LLC	
<b>FIGURE 1-1</b> HUMBOLDT MILL PROJECT - BEA REPORT PROJECT LOCATION	
Scale:	Date: AUGUST, 2008
Prepared by: BJW1	Project No: 06W003





**LEGEND**

- EXISTING ELEV. CONTOUR IN FEET
- PAVED ROAD
- UNPAVED ROAD
- TRAIL
- TREE
- TREE LINE
- FENCE
- SURFACE WATER
- SWAMP/WETLAND
- STREAM/LAKE
- BUILDING
- HUMBOLDT TAILINGS DISPOSAL FACILITY (HTDF)
- APPROXIMATE LIMITS OF PRE-EXISTING IRON ORE TAILINGS DISPOSAL FACILITY
- PROPERTY BOUNDARY
- CALLAHAN PROPERTY OWNERSHIP (KENNECOTT PURCHASE OPTION)
- KENNECOTT EAGLE LAND, LLC (KEL) OWNERSHIP
- O'DOVERO PROPERTY OWNERSHIP (KENNECOTT PURCHASE OPTION)
- EXISTING RAIL LINE

**NOTES:**

- TOPOGRAPHIC AND PLANIMETRIC DATA SUPPLIED BY AERO-METRIC ENGINEERING, SHEBOYGAN, WISCONSIN. DATE OF PHOTOGRAPHY: APRIL 27, 2006, UNLESS OTHERWISE NOTED.
- CONTOUR INTERVAL BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988. HORIZONTAL DATUM BASED ON NAD 83/95. HORIZONTAL COORDINATES BASED ON MICHIGAN STATE PLANE.
- SITE LOCATION: PROJECT SITE WITHIN SECTIONS 2 AND 11, T47N, R29W, HUMBOLDT TOWNSHIP, MARQUETTE COUNTY, MICHIGAN.
- CONTOUR INTERVAL SHOWN IS 10 FOOT.

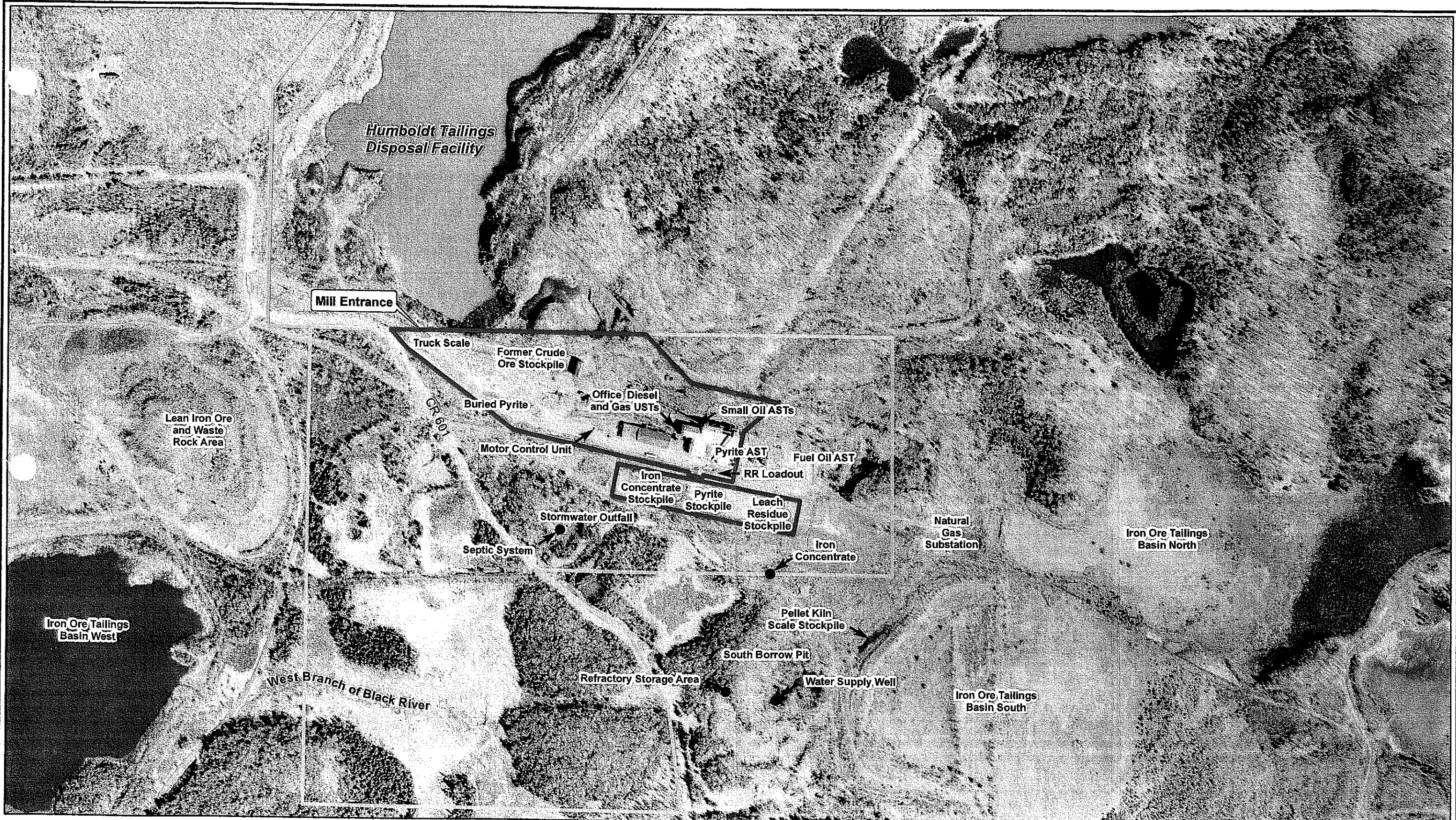
Foth Infrastructure & Environment, LLC			
REVISED	DATE	BY	DESCRIPTION
CHECKED BY:		CED	DATE: AUG. '08
APPROVED BY:		AKM	DATE: AUG. '08
APPROVED BY:			DATE:

**Kennecott**  
Eagle Land, LLC

**FIGURE 1-2**  
**HUMBOLDT MILL PROJECT-BEA REPORT**  
**PROPERTY OWNERSHIP**

Scale: 0 400' 800'  
Date: AUGUST, 2008  
Prepared By: JOW  
Project No. 06W003





**NOTES**

- 1. Orthophotography supplied by Aero-Metric Engineering, Sheboygan, Wisconsin. Date of photography: April 27, 2006.
- 2. Horizontal datum based on NAD 83/96. Horizontal coordinates based on Michigan State Plane North.
- 3. Site Location - Project Site within Section 11, T47N, R29W, Humboldt Township, Marquette County, Michigan.

**LEGEND**

- Property purchased by KEL from Mineral Processing Corp. (MPC)
- Property to be purchased by Kennecott from Callahan Mining Corp.
- Property to be purchased by Kennecott from O'Dovero Properties



Foth Infrastructure & Environment, LLC			
REVISED	DATE	BY	DESCRIPTION
CHECKED BY:		CED1	DATE: AUG. '08
APPROVED BY:		AKM	DATE: AUG. '08
APPROVED BY:			DATE:

**Kennecott**  
Eagle Land, LLC

**FIGURE 1-3**  
**HUMBOLDT MILL PROJECT - BEA REPORT**  
**LOCATION OF EXTERNAL**  
**RECOGNIZED ENVIRONMENTAL CONDITIONS**

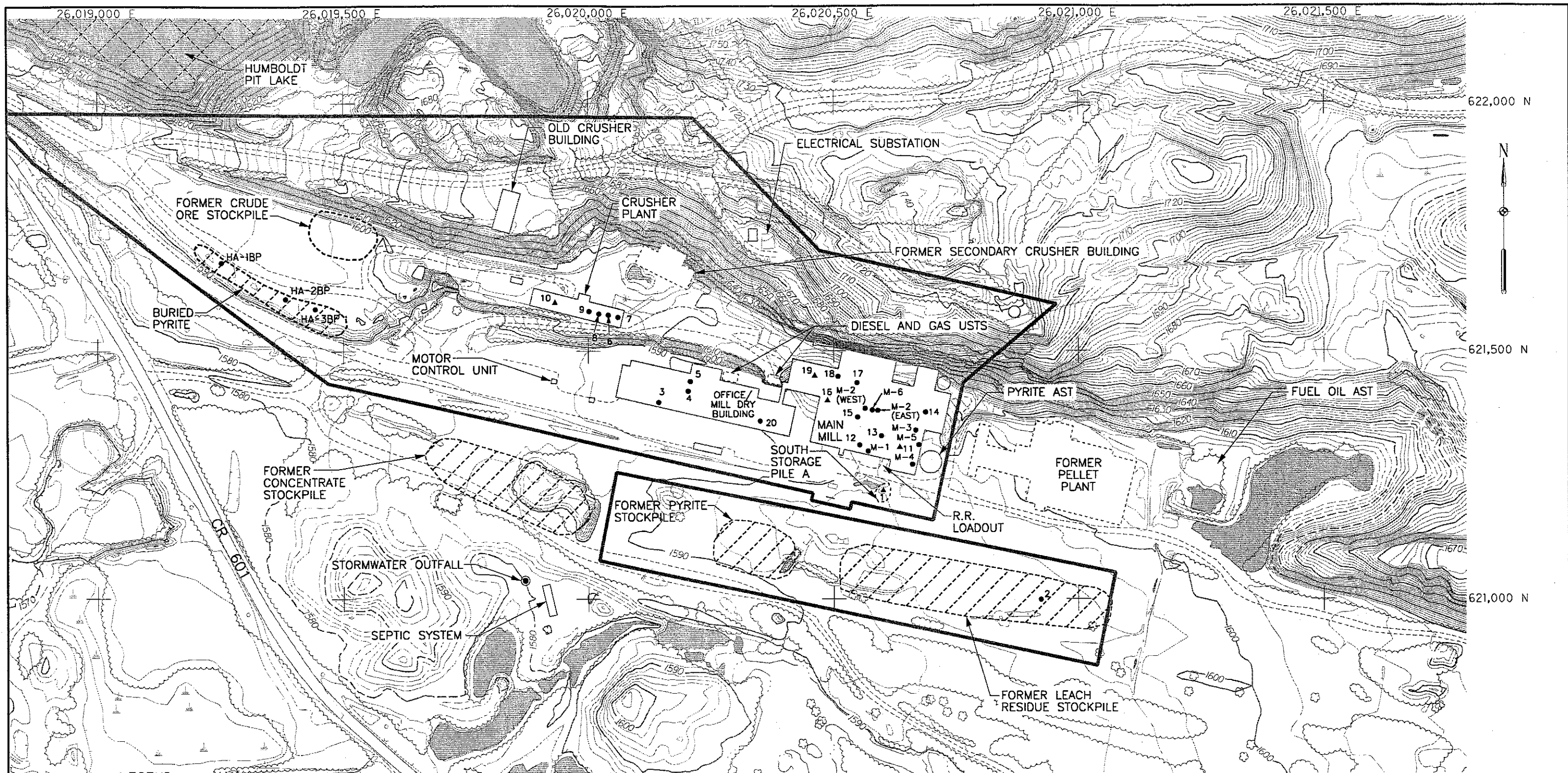
Scale: 0 250 500 Feet

DATE: AUGUST, 2008

Prepared by: BJW1

Project No: 06W003





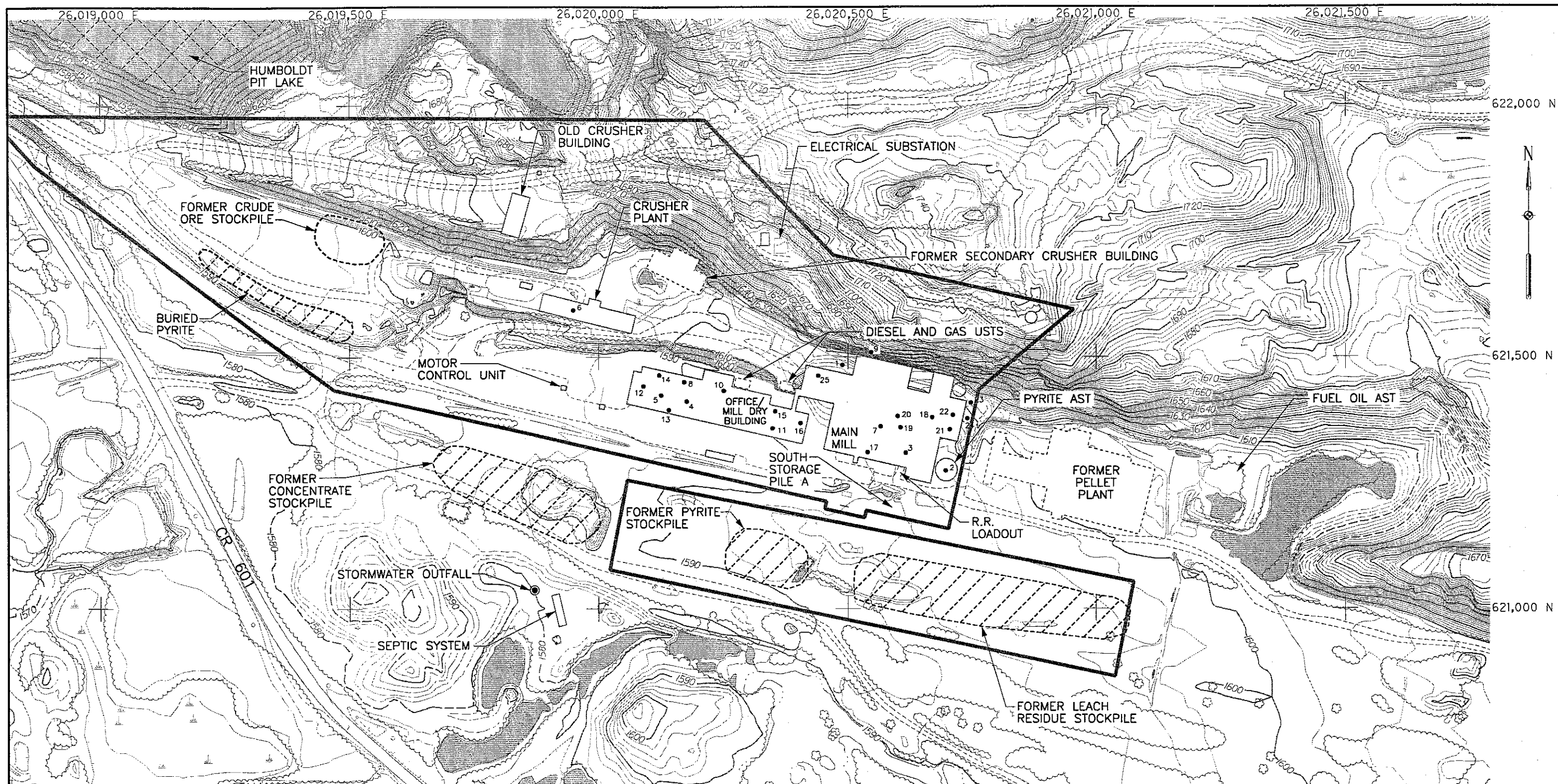
# LEGEND

	EXISTING ELEV. CONTOUR IN FEET		SURFACE WATER
	SPOT ELEVATION		FORMER HUMBOLDT MINE SITE
	TREE		COMPOSITE SAMPLE NUMBER AND LOCATION
	TREE LINE		SINGLE SAMPLE NUMBER AND LOCATION
	BUILDING		PROPERTY PURCHASED BY KEL FROM MINERAL PROCESSING CORP. (MPC)
	TRAIL		
	PAVED ROAD		
	UNPAVED ROAD		
	STREAM/LAKE		

## NOTES:

- TOPOGRAPHIC AND PLANIMETRIC DATA SUPPLIED BY AERO-METRIC ENGINEERING, SHEBOYGAN, WISCONSIN. DATE OF PHOTOGRAPHY: APRIL 27, 2006.
- CONTOUR INTERVAL BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988. HORIZONTAL DATUM BASED ON NAD 83/96. HORIZONTAL COORDINATES BASED ON MICHIGAN STATE PLANE.
- KEL PROPERTY BOUNDARY WITHIN SECTIONS 2 AND 11, T47N, R29W, HUMBOLDT TOWNSHIP, MARQUETTE COUNTY, MICHIGAN.

Foth Infrastructure & Environment, LLC				Kennecott Eagle Land, LLC	
REVISED	DATE	BY	DESCRIPTION		
				<b>FIGURE 3-1</b> <b>HUMBOLDT MILL PROJECT - BEA REPORT</b> <b>MILL BUILDING SAMPLE LOCATIONS</b>	
CHECKED BY:	CED	DATE:	AUG. '08		
APPROVED BY:	AKM	DATE:	AUG. '08		
APPROVED BY:		DATE:		Scale:	Date: AUGUST, 2008
				Prepared By: JOW	Project No. 06W003

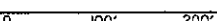


# LEGEND

	EXISTING ELEV. CONTOUR IN FEET		SURFACE WATER
	SPOT ELEVATION		FORMER HUMBOLDT MINE SITE
	TREE		CONTAINER LOCATIONS
	TREE LINE		PROPERTY PURCHASED BY KEL FROM MINERAL PROCESSING CORP. (MPC)
	BUILDING		
	TRAIL		
	PAVED ROAD		
	UNPAVED ROAD		
	STREAM/LAKE		

## NOTES:

- TOPOGRAPHIC AND PLANIMETRIC DATA SUPPLIED BY AERO-METRIC ENGINEERING, SHEBOYGAN, WISCONSIN. DATE OF PHOTOGRAPHY: APRIL 27, 2006.
- CONTOUR INTERVAL BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988. HORIZONTAL DATUM BASED ON NAD 83/96. HORIZONTAL COORDINATES BASED ON MICHIGAN STATE PLANE.
- KEL PROPERTY BOUNDARY WITHIN SECTIONS 2 AND 11, T47N, R29W, HUMBOLDT TOWNSHIP, MARQUETTE COUNTY, MICHIGAN.

Foth Infrastructure & Environment, LLC				<b>Kennecott</b> Eagle Land, LLC	
REVISED	DATE	BY	DESCRIPTION		
				<b>FIGURE 3-2</b>  HUMBOLDT MILL PROJECT - BEA REPORT ABANDONED CONTAINER LOCATIONS	
CHECKED BY: CEDI			DATE: AUG. '08	<div>Scale:  Date: AUGUST, 2008</div> <div>Prepared By: JOW Project No. 06W003</div>	
APPROVED BY: AKM			DATE: AUG. '08		
APPROVED BY:			DATE:		